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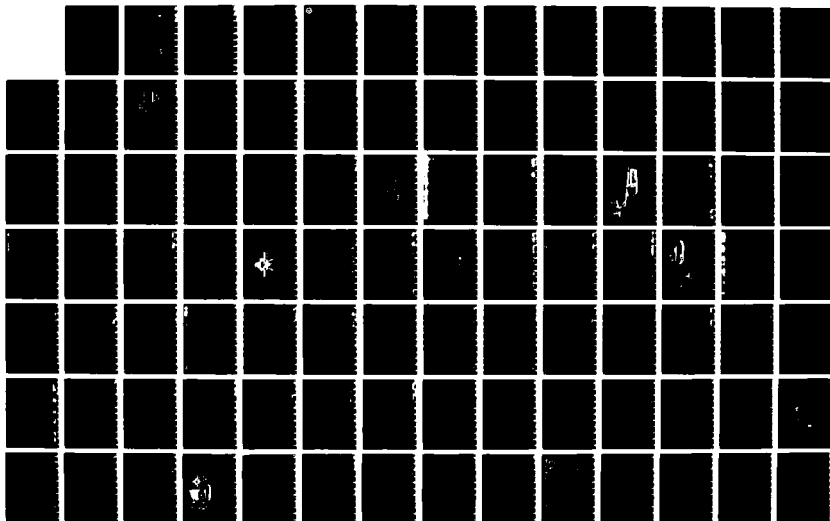
MANUFACTURING METHODS AND TECHNOLOGY PROGRAM PLAN: CY
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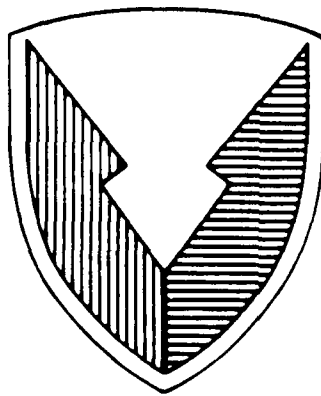




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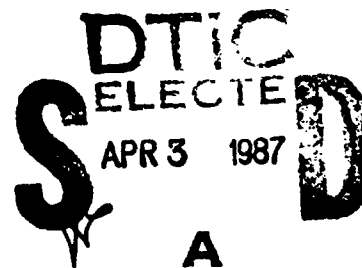


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MANUFACTURING METHODS & TECHNOLOGY

PROGRAM PLAN

CY 1987



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FEBRUARY 1987

PRODUCTION ENGINEERING DIVISION

U S ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY

ROCK ISLAND, ILLINOIS 61299-7260

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US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS 61298-7280

REPLY TO
ATTENTION OF:

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6 FEB 1987

SUBJECT: 1987 AMC MMT Program Plan

SEE DISTRIBUTION (Appendix B)

1. Reference AR 700-90, Army Industrial Preparedness Program, para 3-41(1), dated 15 March 1982.
2. This plan, developed in accordance with the referenced regulation, describes the Army Materiel Command (AMC) Manufacturing Methods and Technology (MMT) Program Plan. The plan takes into account programming actions which have occurred over the past year on the FY 87, 88, and 89 programs and inputs on FY 90 and 91 thrusts.
3. Because of the dynamic nature of military material requirements and the constant change in technology, the inclusion of a project in this plan is not a guarantee of funding. However, the plan does indicate the current technology needs and interests of the AMC community.
4. Additional copies of this document may be obtained by writing the Defense Technical Information Center, Attn: DTIC-TSR-1, Cameron Station, Alexandria, VA, 22314.

J. R. Gallagher
J. R. GALLAUGHER
Director, USA Industrial Base
Engineering Activity

Encl
CY1987 AMC
MMT Program Plan



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FOREWORD

This document presents information for the AMC Manufacturing Methods and Technology (MMT) Program for Fiscal Years 1987-1991. The projects and funding levels for the out-years are for planning purposes only and will change based on technological developments and revisions in program requirements. Since total funding for these planned projects exceeds the projected funds for the Army's MMT Program, some projects will not be funded or may be slipped to later fiscal years. HQ AMC and its subcommands and centers have the authority to reprogram funds to projects with higher priority, thereby affording the flexibility to accommodate new opportunities as they arise.

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I. INTRODUCTION

The MMT Program

The Manufacturing Methods and Technology (MMT) Program serves the U.S. Army Materiel Command (AMC) as a mechanism to bridge between research and development and production. The program's primary aim is to reduce the cost of weapon system production by improving the efficiency of manufacturing processes and by implementing new technology. Although cost reduction is the primary concern of the program, efforts are also directed towards reducing air and water pollution, increasing safety, conserving energy, reducing dependency on critical materials, improving producibility, and increasing productivity.

For many years, the Army has administered its program in compliance with the regulatory requirements of the MMT Program as cited in AR 700-90, the Army Industrial Preparedness Program. Information generated from the budgeting and execution of the Army's program has been maintained in a central data base and made readily available to DOD organizations and private industry.

In May 1985, the Department of Defense Instruction, DODI 4200.15, Manufacturing Technology Program, was revised. That document modified the requirements of the program and directed the development of a DOD MT data base. That DODI, as well as an Army redirected emphasis from the program, has caused and is causing significant change in the size and administration of the program. Procedures to implement the DODI and the Army direction were developed and put into effect during the course of 1986.

The MMT Program Plan

The MMT Program Plan, CY 1987, provides within a single source a summary of current and near-term efforts included in the Army Materiel Command MMT Program. Since weapon systems requirements and the technology for these systems are constantly changing, inclusion in the Program Plan is not a guarantee that an individual project will be funded. However, the plan does serve as an indicator of the areas towards which resources will be directed and the magnitude of the Army's commitment to this program.

Organization of the MMT Program Plan

This document contains a 5 year plan for each MMT project code covering fiscal years 1987 - 1991 (Section V). Each plan contains a list of all tasks proposed under that funding code. These tasks are grouped according to the sponsoring Major Subordinate Command. Individual tasks are identified by a four digit number and title. Other information includes a brief description of the manufacturing problem, the proposed solution, and the proposed funding requirements.

An index is provided to aid in locating the tasks of specific commodity commands (Section IV). The information contained in this listing is briefer than in the main listing, but the page number of each task's detailed listing is included so that more information may be easily located. The index section also contains the addresses and phone numbers of the MMT representatives of each of the listed commodity commands.

II. PLANNED FUNDING

The AMC Major Subordinate Commands propose expenditures during the 5 year planning period of \$150 million. The HQ AMC planned funding level totals to \$120 million for the period. Planned funding in the individual years is essentially constant over the period.

The Army MMT Program is funded under the RDT&E appropriation and contains eight separate R&D projects. The level of planned expenditures for each appropriation is illustrated by Table 1. For comparative purposes, this table also contains the total funding guidance for each fiscal year. In some cases, several of the Commands share a project. Distribution of the appropriations among the Commands is shown on Table 2.

SUBMACOM SUBMISSION TO MMT PROGRAM
BY PROJECT AREA (Thousands of Dollars)

<u>Project Area</u>	<u>Project Code</u>	<u>FY 87</u>	<u>FY 88</u>	<u>FY 89</u>	<u>FY 90</u>	<u>FY 91</u>
Communications/Electronics	DE50	3159	875	539	555	584
Other Support Equipment	DE51	3445	4856	5545	7786	5609
Aircraft	DE60	353	490	423	446	470
Missiles	DE61	822	1306	1686	868	1274
Weapons and Tracked Combat Vehicles	DE62	4083	7210	4237	3708	3324
Ammunition	DE63	10798	10089	9478	9496	10339
Tactical and Support Vehicles	DE64	1963	4017	1714	300	200
Industrial Modernization Incentives Program	DE66	2190	6604	6624	6101	6086
TOTALS		26,813	35,447	30,246	29,260	27,886
HQ AMC PLANNED FUNDING LEVEL		20,757	22,880	22,721	25,201	26,541

This table shows the planned funding for each fiscal year in the planning period. The "Project Area" column identifies the various RDTE project accounts established for the MMT Program.

TABLE I

SUBMACOM SUBMISSION TO NMT PROGRAM
BY COMMAND (Thousands of Dollars)

Command	Project Area	Project Code	FY 87	FY 88	FY 89	FY 90	FY 91
ANETA	Other Support Equipment	DE51	400	148	336	326	0
AVICOM	Ammunition	DE63	10798	10089	9478	9496	10339
	Weapons & Tracked Combat Vehicles	DE62	1578	3295	2597	3008	3124
	Other Support Equipment	DE51	1149	1654	1618	1644	1683
AVSCOM	Aircraft	DE60	353	490	423	446	470
CECOM	Communications/Electronics	DE50	225	875	539	555	584
DESCOM	Communications/Electronics	DE50	2304	0	0	0	0
	Weapons & Tracked Combat Vehicles	DE62	400	1110	240	300	0
	Tactical & Support Vehicles	DE64	1040	1173	0	0	0
	IMIP	DE66	2190	6504	6624	6101	6086
LABCOM	Communications/Electronics	DE50	630	0	0	0	0
	Other Support Equipment	DE51	1119	1286	1338	2801	0
NAVCOM	Missiles	DE61	822	1306	1686	868	1274
TACOM	Weapons & Tracked Combat Vehicles	DE62	2105	2805	1400	400	200
	Tactical & Support Vehicles	DE64	923	2844	1714	300	200
	IMIP	DE66	0	100	0	0	0
SECUM	Other Support Equipment	DE51	250	257	252	255	261
TRIDE	Other Support Equipment	DE51	80	46	333	460	0
TRISCOM	Other Support Equipment	DE51	447	1465	1668	2300	3665
TOTALS			26,813	35,447	30,246	29,260	27,886

This table shows the planned expenditures for each fiscal year in the planning period. The "Command" column identifies the AMC Major Subordinate Commands and Activities which participate in the NMT Program.

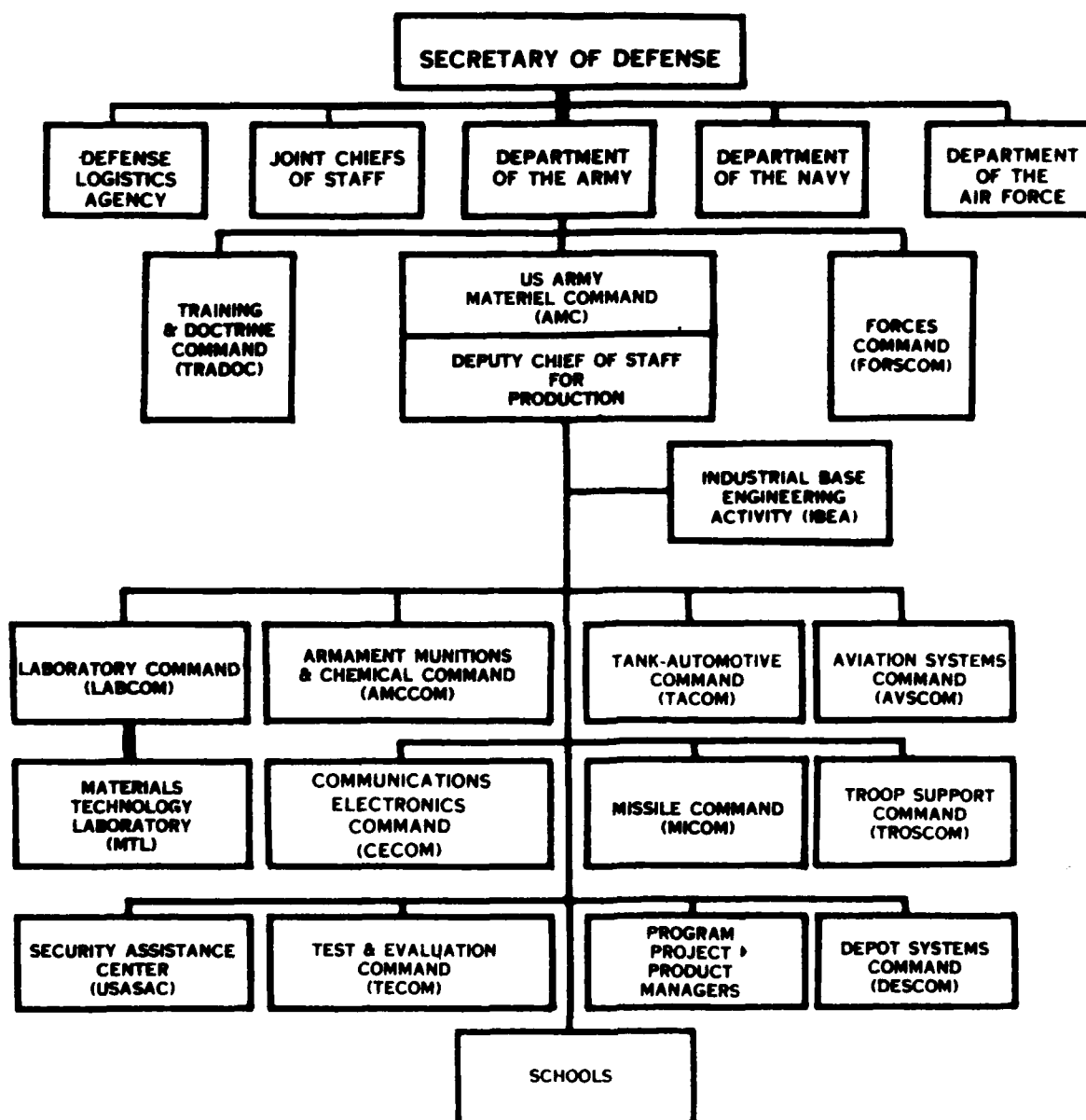
TABLE 2

III. POLICY GUIDE

Overview

The objective of the MMT Program is to develop emerging manufacturing methods and processes that will reduce the cost of weapon systems produced in government-owned facilities. Within AMC, the Deputy Chief of Staff (DCS) for Production is charged with overall program responsibility. The Industrial Base Engineering Activity (IBEA) is now assigned greater responsibilities in managing the MMT Program within the office of the DCS for Production. IBEA's new tasks include: formulating and proposing policy, establishing procedures for administering the program, formulating budgets, and approving projects. IBEA continues to operate and maintain a data base on all projects. The functional responsibility of the MMT Program is assigned to the commodity oriented, major Commands that are subordinate to AMC. These Major Subordinate Commands (MSCs) plan, formulate, budget and execute individual MMT tasks. The chart on the next page depicts the hierarchical relationship of these organizations.

UNITED STATES ARMY MATERIEL COMMAND (AMC)



The MMT Planning/Budgeting/Review/Reporting Cycle, in calendar year 1986, passed through a transition to a new system. The change was made in order to comply with both the reporting requirements specified in DODI 4200.15, Manufacturing Technology Program, and the needs resulting from the Army de-emphasis on direct funding of the MMT Program. Figure 1 on the next page contains a calendar which depicts the key events under the new system. The following provides an overview of the current procedures.

Identification of manufacturing problems is the first step in developing an annual program. Problem areas are conceptualized by the MSCs and sent to IBEA on a quarterly Program Update Document which once a year is compiled into a 5-year planning document (the Program Plan). As the program cycle proceeds, out-year plans are refined and project proposals are prepared and submitted in April for evaluation during the budget review phase. Those proposals are documented in what is known as an RD-6. The RD-6 is simply a format used to document estimated project cost, benefits, technical identifiers, and description of work. The initial submission of an RD-6 is generally the only one needed for a multi-year effort; only a significant change in the effort's scope of work, or an increase in its total cost dictate a subsequent submission.

The budget RD-6 submission represents the formal bid for inclusion in the program. Although this is the normal cycle, a project can enter it at any point in time. Such a project is known as a late start submission and funding is usually granted at the expense of another project. If the late start project initiates a new work effort, an appropriate RD-6 submitted with the Program Update Document provides a notification of the request. If the late start project is for work which has already been initiated in prior years and does not exceed the total costs of all fiscal years contained in the last RD-6, then all that need be updated is the funding flow information of the Program Update Document.

Approximately 18 months after the call for RD-6s, individual tasks are funded in one of eight projects of the RDT&E appropriation; Communications/Electronics, Other Support Equipment, Aircraft, Missiles, Weapons and Tracked Combat Vehicles, Ammunition, Tactical and Support Vehicles, and the Industrial Modernization Incentives Program. After funding, the execution of the work of all active efforts are reported semiannually. When the work is completed, the implementation status and benefits are surveyed annually via Effectiveness Reports.

CALENDAR OF KEY EVENTS

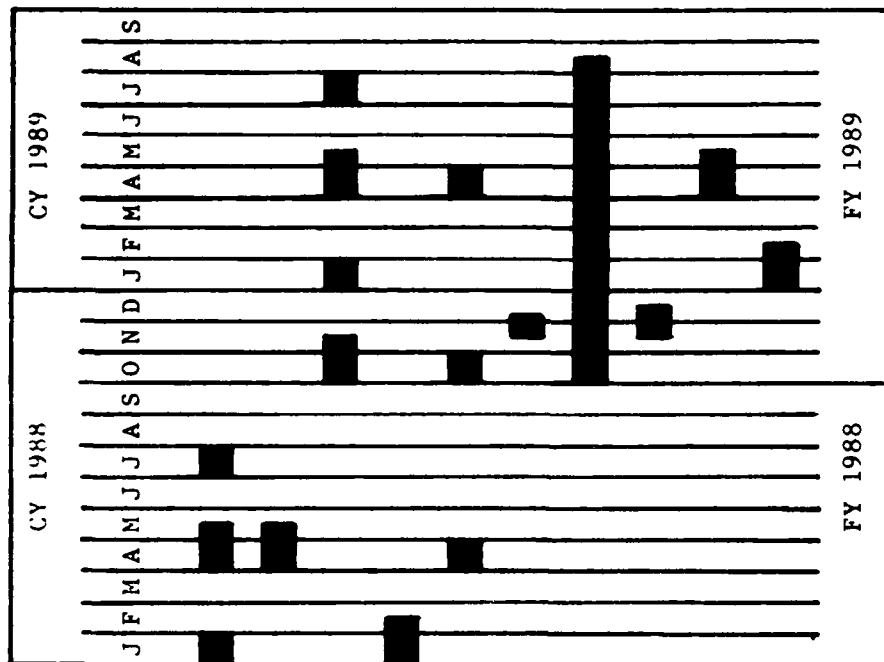


FIGURE 1

Role of Industry in MMT

The first and primary implementation of any technology developed in an MMT project must be made at an internal Army facility and be used in support of in-house Army production. While the new policy on the MMT Program which is directly funded by the Army reduces industry participation from what it had been in the past, the role of private industry in MMT remains an active and vital aspect of the program. The services of private contractors will continue to be engaged in the development and installation of technology and equipment for in-house Army production. In addition, policies are being formulated which will permit contractor involvement in the development and implementation of manufacturing technology through the use of production overhead accounts.

Industry has the opportunity to participate in the technical evaluation of the budget program during the annual Manufacturing Technology Advisory Group (MTAG) conference. The MTAG conferees can also discuss the out-year concepts contained in the Program Plan and suggest technical adjustments to the current program.

A substantial portion of the annual program is placed on contract. In recent years, about 60 percent of the funding has been awarded to the private sector. Emphasis is placed on free competition for MMT contracts, with equal opportunity given to all interested, qualified business firms.

Services and materiel are acquired from industry by two basic methods - formal advertising and negotiation.

Congress has established formal advertising as the preferred method of contracting for military supplies and services. The Army derives price and other benefits that result from a full and free competition for contracts. Formal advertising also provides all bidders with an equal opportunity to develop and submit bids based on the same set of Army specifications. Procedures are prescribed by law and are detailed and rigidly written to assure equal treatment for all bidders.

The prerequisites for formal advertising are quite specific; and they are critical, because absence of any one of them will preclude successful use of the method. The prerequisites are as follows:

1. Army specifications must be complete, explicit, available to all potential bidders, and unrestricted because of security.
2. Two or more capable sources must be available to assure competition.

3. There must be enough time to conduct the procedures as prescribed. The Army must develop and assemble a complete statement of needs, terms, and conditions of contract into a proper Invitation for Bid. Bid invitations must be distributed; bids prepared and submitted by bidders, opened and evaluated by the Army, and a contract awarded. This process may span 60 to 120 days.
4. The Army must select the successful bidder on the basis of price alone, provided the bidder is otherwise qualified as responsive and responsible.

A variant procedure, closely approximating formal advertising, is referred to as "two-step formal advertising." This method is used when existing specifications are inadequate for use. Although not as preferable as formal advertising, "two-step formal" is clearly preferable to negotiation, and its use is required where the following prerequisites exist:

1. Specifications are not definitive. Technical discussions and evaluations must insure mutual understanding between Army and prospective contractors.
2. Definite criteria for evaluating proposals from prospective contractors exists.
3. More than one technically qualified source is expected to compete.
4. There must be enough time to conduct the two-step procedure; normally 100 to 150 days.
5. A "firm fixed price" or a "fixed price" contract will be used.

The first step of the process is initiated by the Army's request for technical proposals based upon performance specifications. These proposals are evaluated and discussed by both parties as necessary, but price is not a subject for these discussions. The Army then makes a determination as to the technical acceptability of the supplies or services offered and may summarily reject some outright, or make provisions for modification and acceptance of proposals that are marginal.

The second step of the procedure is conducted as a formally advertised procurement, except that advertising is limited to those who have submitted technically acceptable proposals during the first step. Each bidder must then bid on the basis of meeting the performance specification and providing the exact supply or service proposed by him and approved by the Army during the first step. Although products or services of the bidders may vary, award of contract is based on price alone.

Not all requirements can be obtained through the advertising processes. As a third alternative, acquisition by negotiation is permitted. The development of new systems or production of complex equipment, for example, demands much discussion, clarification, exploration, or modification of proposals between both parties. Under specific circumstances prescribed by Congress, negotiation is generally preferable when:

1. The item is critical or complex.
2. Delivery is urgent.
3. Few suppliers exist and competition is impractical.
4. Specifications are incomplete or unstable.
5. Emergency conditions exist.
6. The item required may demand a sizable investment by industry in fixed assets.
7. Security classification precludes advertising.
8. Total interchangeability of parts with existing supplies is absolutely necessary; no compromise is justified.
9. Industry experience is lacking. Responses to formal advertising will be replete with contingency costs.
10. The Army must deal with sole or limited sources.

The negotiation process resembles the purchasing process used in industry. Not all industry practices, however, are accepted in the negotiation process. For example, companies that buy from each other often develop long term understandings. In contrast, this relationship between the Army and a private company is not permitted.

Formal advertising is conducted in full public view with the bids of all firms known to all competitors prior to award of contract. This is not true in negotiation. Negotiation is a process closed to the public. Proposals submitted by a company are not disclosed and subsequent bargaining on the basis of these proposals are conducted individually. In this way, the spirit of competition is maintained among the few suppliers that may be participating. Only after the award of a contract is the successful company made known and the terms and conditions of the contract disclosed.

In recent years, more than one-half of all Department of Defense requirements have been purchased by "two-step" procedures and negotiation. Most MMT contracts have been reached through the same methods.

A business firm seeking to participate in the MMT Program should inform Army procurement offices of the capabilities it has to offer and request that the firm be placed on appropriate bidders' mailing lists. Copies of Standard Form 129, "Bidders Mailing List Application," are available at most federal agency procurement offices. A copy of this form is included in the publication "Selling to the Military." This publication also contains a comprehensive list of procurement offices and it may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402.

Each procurement office has unique supplemental instructions for the Bidders Mailing List Application; therefore, individual requests should be directed to each office. These instructions should be followed carefully to assure prompt processing. After a firm is placed on the list, it will receive all solicitations covering any requirements that could be met by its stated capabilities.

The "Commerce Business Daily," published by the Department of Commerce, is a valuable source of information to businessmen in identifying products and services which individual military procurement offices are currently buying. The publication also lists subcontract opportunities offered by Defense prime contractors, recent contract awards which could lead to imminent subcontract opportunities, surplus sales information, and other pertinent information on procurement actions. The "Daily" is available for inspection at each of the procurement offices; the field offices of the Small Business Administration, Department of Commerce, and General Services Administration; and, other cooperating offices, including many local chambers of commerce. It can also be purchased through annual subscription. To order, send \$243 for 1st class postal delivery or \$173 for 2nd class along with a full mailing address to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Credit card orders are accepted: telephone (202) 783-3238.

IV. COMMAND INDEX

A single organization may sponsor MMT tasks under more than one funding code. As the main body of this document (section V) is organized according to funding code, tasks of a participating organization may be reported among different codes. This index is organized by sponsoring organization, providing a convenient listing of each organization's tasks. The information provided is more concise than that provided in the main listing. However, more detailed information can be located in the main listing through the cross-referenced page provided for each task.

<u>Organization</u>	<u>Point of Contact</u>	<u>Page No.</u>
AMCCOM	Mr. Richard Koppenaal AMSMC-PBT-I (D) AUTOVON 724-4221	16
AMETA	Mr. Paul Wagner AMKOM-SE AUTOVON 793-4041	16
AVSCOM	Mr. N. Singh AMSAV-EMC AUTOVON 693-3079/3080	22
CECOM	Mr. Al Feddeler AMSEL-POD-P-G AUTOVON 995-4926	22
DESCOM	Mr. Mike Ahearn AMSDS-RM-EM AUTOVON 570-8591	22
LABCOM	Mr. Bob Moore AMSLC-CT AUTOVON 290-4677	24
MICOM	Mr. Bobby Park AMSMI-RD-SE-MT AUTOVON 746-2147	24
TACOM	Mr. Jamie Florence AMSTA-TMM AUTOVON 786-6065	24

<u>Organization</u>	<u>Point of Contact</u>	<u>Page No.</u>
TECOM	Ms. Cynthia Vincenti AMSTE-TC-M AUTOVON 298-3677/2170	26
TMDE	Mr. Ken Magnant AMXTM-S AUTOVON 746-1850/2575	26
TROSCOM	Mr. Richard Green AMSTR-PT AUTOVON 693-2818	26

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMC	DE51	5052	ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT	87	400	33
				88	148	
				89	336	
				90	326	
				87	250	33
AMCCOM	DE51	0918	MODERNIZATION OF FILTER PENETRATION EQUIPMENT	88	466	
			VELOCITY TRAVERSE MAPPER FOR CHARCOAL FILTERS	87	100	33
			MMT FOR XM22 CHEMICAL AGENT ALARM SYSTEM	88	100	
			MMT FOR ANTIBODIES FOR DETECTION SYSTEMS	87	271	33
				88	150	
				87	200	34
				88	300	
				89	300	
				90	510	
				91	900	
AMCCOM	DE51	0941	MODERNIZATION OF AEROSOL AGENT TEST EQUIPMENT	90	250	34
			IMPROVED PENETRATION FILTER TEST EQUIPMENT	89	300	34
			AUTOMATED PENETRATION INDICATOR SYSTEM	89	100	34
			GAS TECHNOLOGY APPLIED TO PRODUCTION MASK TESTER	89	150	34
			MANUFACTURING TECHNOLOGY FOR ENZYME FOR DETECTION SYSTEMS	89	768	35
				90	884	
				91	783	
			MOD OF CHARCOAL FILTER TEST EQUIPMENT	87	328	35
				88	638	
			SMALL ARMS WEAPONS NEW PROCESS PRODUCTION TECHNOLOGY	87	50	49
AMCCOM	DE62	8120	ADAPTIVE CONTROL TECHNOLOGY	88	200	49
				89	200	
			MANUFACTURE OF MOLDED GLASS LENSES	89	50	49
				91	100	

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		8231	IMPROVED CASTING TECHNOLOGY (CAD/CAM)	88	195	49
				89	335	
		8262	PRODUCTION METHODS FOR OPTICAL WAVEGUIDES	87	50	50
				88	73	
				89	53	
		8329	FIRE CONTROL OPTICAL DEVICES NEW PROCESS PRODUCTION TECH	90	178	50
				91	275	
		8352	SKIVING OF GUN TUBE BORES	88	135	50
				89	135	
		8365	PRODUCTION METHODS FOR RADIAL GRADIENT INDEX LENSES	89	50	50
				90	50	
				91	100	
		8370	AUTO INSPECTION + PROCESS CONTROL OF WEAPONS PARTS	87	40	50
		8403	PRODUCTION CRITERIA FOR HARDENING (CAD/CAM)	87	73	51
		8442	AUTOMATIC MACHINING OF CHARPY + TENSILE BLANKS	89	80	51
AMCCOM	DE62			90	60	
				91	100	
		8509	COMPUTERIZED FOUNDRY MELT COMPOSITION CONTROL	90	250	51
				91	270	
		8510	AUTOMATED INSPECTION OF RECOIL COMPONENTS	87	167	51
				88	410	
		8518	THIN FILM COATINGS FOR LASER EYE PROTECTION	88	330	52
		8545	GAS SHIELDED METAL POWDER ARC WELDING	90	150	52
		8546	MACHINERY CONDITIONS SURVEILLANCE SYSTEM	88	25	52
		8552	ELECTROPOLISHING TO IMPROVE TUBE FATIGUE LIFE	90	150	52
		8553	APPL OF REFRACTORY + OTHER COATINGS BY THE SPUTTERING TECH	89	296	52
				90	50	
				91	470	
		8559	CIM FOR CANNON, CAE/CAM/COMM	87	383	53
				88	712	

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE62	8573	GENERIC GUN GYMNASTICATOR	89	200	53
				90	200	
				91	200	
		8611	AUTOMATED ANALYSIS + CONTROL OF PLATING BATHS	87	138	53
				89	125	
		8621	ADVANCED TUBE MANUFACTURING	91	150	53
		8625	MANUFACTURING OF MULTI-LUG BREECH MECHANISMS	88	30	54
		8635	PROCESS CONTROL AND INFORMATION SYSTEM	88	150	54
				90	150	
		8636	IMPROVED BARREL INSPECTION TECHNIQUES FOR THE M16	88	30	54
		8637	SIMULATION + MODELING OF MFG PRODUCTION (WPNS + FIRE CONTROL	91	100	54
		8638	CONTROL OF SEQUENTIAL MACHINING OPERATIONS	87	194	55
				88	370	
		8641	MFG OF TITANIUM ALLOY METAL MATRIX CANNON COMPONENTS	87	100	55
				88	265	
		8642	APPLICATION OF ADVANCED MATERIALS TO CANNON PRODUCTION	87	200	55
				88	150	
				89	150	
		8718	WELD REPAIR AND MAINTENANCE OF H.S.S. TOOLING	90	155	55
				91	60	
		8721	OPTIMIZATION OF MANUFACTURING METHODS	89	120	56
				90	140	
		8727	IMPROVED HANDLING OF HOT ROTARY FORGED TUBES	90	100	56
		8731	METHOD FOR FABRICATING COMPOSITE GUN TUBES	89	150	56
				90	100	
		8805	CHROME RECOVERY FROM PLATING PROCESS	90	110	56
		8815	EXPERT KNOWLEDGE DATA BASE FOR WELDING	90	175	56
				91	140	

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE62	8817	CONTINUOUS PROCESS FOR FIRE CONTROL OPTIC GLASS	87	183	57
				88	120	
				89	200	
				90	84	
		8823	CERAMIC METAL (CERMET) BARREL PLATING TECHNOLOGY	88	100	57
				89	58	
				90	100	
				91	100	
		8909	ADVANCED INSPECTION OF THREADS	89	80	57
				90	400	
AMCCOM	DE63	8917	PRECISION GLASS MOLDING	91	170	
				89	180	57
				90	200	
				91	250	
		8918	AUTO FIRING TESTING FOR THE M16A2 + M60 GUN BARRELS	91	100	58
		8920	SYNTHETIC GLASS	91	94	58
		8926	TOOL/WORKPIECE POSITION ANALYSES	90	206	58
				91	145	
		8927	INJECTION MOLDING OF RUBBER SEALS FOR GUN MOUNTS	89	135	58
		9032	ADVANCED MATERIAL HANDLING AND DISTRIBUTION	91	300	59
AMCCOM	DE63	1805	IMPROVED PRODUCTION VIBRATION TESTS-M732 (PIP) FUZE	87	120	65
		1808	ADVANCED OPTICAL MICROELECTRONICS INSPECTION SYSTEM	88	1300	65
		4078	UPGRADE SAFETY READINESS + PRODUCTIVITY OF EXIST MELT POUR	87	928	65
		4164	ANAL OF VIBRATION SIGNATURE F/PREDICTING MFG TOOL FAILURE	91	230	65
		4368	DEVELOP M55 DETONATOR SEALING EQUIPMENT	90	489	66
		4427	EVALUATE ON-LINE CHEMICAL ANALYZERS F/NITROGUANIDINE PLANT	89	511	66
				90	651	
		4449	PROCESS IMPROVEMENT FOR COMP C-4 + PBX EXPLOSIVES	89	234	66
		4473	AUTOMATED LEAK DETECTION OF WP MUNITIONS	87	255	66

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
AMCCOM	DE63	4520	PRESS LOADING HMX COMPOSITIONS INTO TANK ROUNDS	88	618	67
		4531	AUTO PROD OF MULTI BASE STICK PROPELLANT ON CAMBL	89	455	67
		4539	AUTOMATED CARTRIDGE CASE HARDNESS MEASUREMENT + CONTROL	87	667	67
		4545	DIGITAL IMAGE AMPLIFICATION X-RAY SYSTEM (DIAIX)	88	464	67
		4578	MODIFICATION + IMPROVEMENT OF DMSO PILOT PROCESS FOR RDX/HMX	87	575	67
		4624	AUTOMATED MANUFACTURE OF MILLIMETER WAVE DIODES	87	866	67
		4625	AUTOMATED TESTING OF SILICON IF AMPLIFIER IC	88	383	68
		4626	AUTOMATED ASSEMBLY OF THE MILLIMETER WAVE TRANSDUCER	87	556	68
		4628	AUTO MANUFACTURE OF IR DETECTORS AND REFLECTORS	87	816	68
		4629	AUTO ASSEMBLY + TEST OF IR TRANSDUCER	88	572	68
		4630	AUTOMATED METHOD OF BORESIGHTING IR	89	602	68
		4631	AUTO TEST OF SIGNAL PROCESSOR ASSEMBLIES	90	1896	68
		4634	AUTO ASSEMBLY OF ELEC MODULE AND TOP SENSOR	88	1166	68
		4637	AUTOMATED MANUFACTURE & INSPECTION OF SFF WARHEAD LINERS	91	1393	69
		4638	PRESS LOADING PROCESS FOR EXPLOSIVE FORMED PENETRATORS	87	1294	69
		4645	AUTOMATED CUP INSPECTION	91	1346	69
		4656	NITRAMINE PROPELLANT PROCESSING	90	761	69
				91	491	69
				90	912	69
				91	702	70
				87	400	70
				88	1826	70
				89	300	70
				89	660	70
				90	696	70
				87	459	70
				88	267	70
				87	891	70
				89	655	70

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		4660	AUTOMATED BLENDING OF STICK PROPELLANT	87	1365	71
		4666	PROTOTYPE SPIRAL WRAP PROCESS 155MM COMBUSTIBLE CASE COMPON	88	375	
		4693	REMOTE AUTOMATIC SAMPLING OF NITROGLYCERIN (NG)	87	330	71
				87	362	71
		4768	SINGLE BASE STICK PROCESSING	88	176	
				90	250	71
				91	1500	
		4771	IMPROVED DF PROCESS TECHNOLOGY FOR BINARY MUNITIONS	88	388	71
		4780	SPRAY DRYING OF EXPLOSIVE COMPOSITIONS	90	321	72
				91	470	
		4781	AUTOMATIC GAGE FOR THREAD INSPECTION	89	700	72
		4787	HIGH BULK DENSITY NITROGUANIDINE PROCESS	89	400	72
				90	1100	
				91	594	
		4788	AUTOMATED MELT POUR EQUIPMENT F/MEDIUM SIZE PROJECTILES	90	599	72
				91	253	
		4789	MECHANIZATION OF ASSY OPERATIONS FOR MICLIC	87	288	73
				88	213	
				89	727	
		4798	REGENERATION OF SPENT CARBON CONTAINING NITRO-AROMATIC COMP	87	481	73
				89	306	
		4803	AUTOMATED INCONEL LAMINATE FABRICATION	90	922	73
				91	428	
		4819	ASSEMBLY TECHNIQUES, TANTALUM TO TITANIUM	91	600	73
		4821	PRECISION CAST LOADING TECH F/OCTOL IN EXPLOSIVE FORMED PPEN	90	517	74
				91	700	
		4836	INFRARED MOISTURE ANALYSIS OF NOL130 AND LEAD AZIDE	89	120	74
		4838	INTEGRATED STATIC ELECTRICITY HAZARD CONTROL PROGRAM	90	288	74
				91	250	
		4841	WATER BASED FORGING LUBRICANTS EVALUATION	87	265	74
				88	290	
		4843	PROTO NC PAPER LAMINATION/MOLD PROC F/155MM COMB CASE COMP	91	500	75

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		4853	DESENSITIZED NG STORAGE	88	500	75
				89	1200	
		4854	DYNAMIC SEPARATORS FOR NITRATE ESTER MANUFACTURE	90	500	
				90	500	75
		4855	PROD PROCESSES F/THERMALLY ENHANCED PROJECTILE TRACERS	91	1250	
AMCCOM	DE63	4857	VOLATILE ORGANIC CARBON EMISSION ABATEMENT	91	500	75
		4858	AUTO INSPECTION OF WELDED OVERLAY ROTATING BANDS	90	250	75
				91	290	76
		4862	IMPROVED M223 FUZE ASSEMBLY EQUIPMENT	91	275	
				89	750	76
		7456	LOW COST TOOLING FOR AIRFRAME AND ROTOR COMPONENTS	90	700	
				90	446	41
		7551	COMPUTER INTEGRATED MANUFACTURING	91	470	
XVSCOM	DE60			87	353	41
				88	90	
		7563	PROGRAMMABLE ELECTRONIC TORQUE WRENCH F/AEROSPACE APPLICATN	89	423	
		3180	ROBOTIC CONTROL OF LASER WELDING	88	400	41
				87	225	29
				88	325	
		3186	NIGHT VISION/LASER OPTICAL-REPAIR	89	300	
CECOM	DE50			88	150	29
		3194	ROBOTIC CONTROL OF PLATING	89	39	
				90	355	
				91	584	
				88	400	29
				89	200	
				90	200	
DESCOM	DE50	6005	MATERIAL TRACKING USING MICROCHIPS	87	2304	30
DESCOM	DE62	3001	POWER + INERTIA SIMULATOR (PAISI) COMBAT VEHICLE TESTING	87	300	59

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COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
		3004	CLEANING OF MAJOR COMPONENTS	88	660	59
				89	240	
				90	300	
DESCOM	DE62	4003	RUBBER INJECTION MOLDING OF DOUBLE PIN TRACK	87	100	59
				88	200	
		8008	SMALL ARMS TARGETING (LASER)	88	250	60
		3003	SYSTEM FOR ALIGNING + MATING OF POWER PLANT COMPONENTS-SAMP	88	160	79
		7004	AUTOMATED ENGINE BLOCK MACHINING	87	580	79
				88	150	
DESCOM	DE64	7007	ENGINE CONTAINER SEALING	87	318	79
		7009	AUTOMATED ENGINE CRANKSHAFT GRINDING	87	142	79
				88	863	
		1006	ROBOTIC REPAIR OF PRINTED CIRCUIT BOARDS	87	250	83
				88	1304	
				89	1674	
				90	2000	
				91	2000	
		1007	INTEGRATED MANUFACTURING IMPROVEMENT PROGRAM	88	1500	83
				89	1000	
				90	1000	
				91	1543	
		2002	LETTERKENNY EVAL ANALYSIS + PLANNING PROGRAM	87	692	83
				88	1000	
				89	750	
				90	801	
				91	500	
DESCOM	DE66	6003	CCAD INTEGRATED MODERNIZATION PROGRAM	87	648	83
				88	1500	
				89	1000	
				90	1000	
				91	1543	

MMT COMMAND INDEX

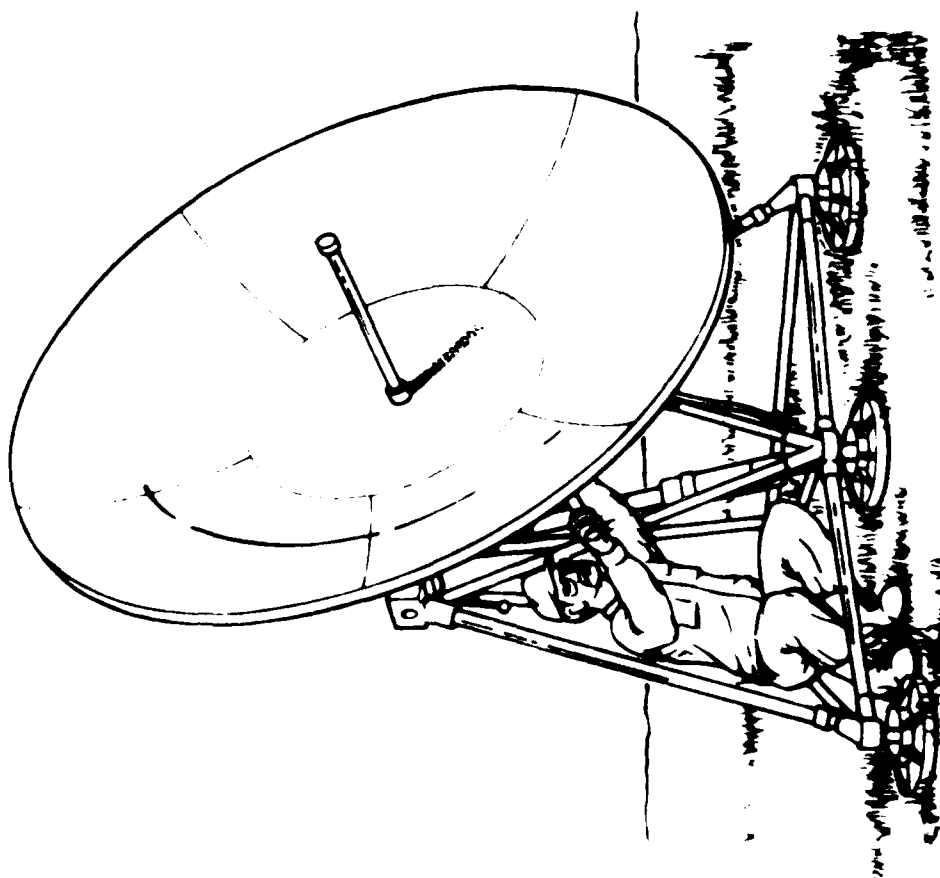
COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
DESCOM	DE66	6090	DEPOT ANALYSIS OF RESOURCES AND TECHNOLOGY	87	600	83
				88	1000	
				89	1000	
				90	1000	
				91	500	
		9002	LEXINGTON-BLUE GRASS PRODUCTIVITY IMPROVEMENT PROGRAM	88	200	84
				89	1200	
				90	300	
				87	630	30
				87	993	35
LABCOM	DE50	8006	RESOLVING MFG ISSUES IN DOD-STD-2000, INFRA-RED + X-RAY	88	1036	
				89	1088	
				90	2551	
				87	126	35
				88	250	
		6350	MANUFACTURING TESTING TECHNOLOGY PROGRAM	89	250	
				90	250	
				87	200	45
				88	616	
				87	622	45
		1109	ROBOTIZED WIRE HARNESS ASSEMBLY SYSTEM	88	690	
				89	718	
				91	1274	45
				89	250	45
				89	718	46
MICOM	DE61	2002	CHEAP RAPID OPTICAL FABRICATION TECHNOLOGY (CROFT)	90	868	
				87	125	60
				88	178	
				89		
				90		
		1147	OPTICAL FIBER WINDING	87		
				88		
				89		
				90		
				91		
		2021	CIM TECHNIQUES FOR MISSILE HYBRID MICROELECTRONIC ASSEMBLIES	87		
				88		
				89		
				90		
				91		
TACOM	DE62	2036	ROBOTIZED WIRE HARNESS ASSEMBLY SYSTEMS ENHANCEMENTS	87		
				88		
				89		
				90		
				91		
		4035	LASER PROCESSING OF STEEL COMPONENTS FOR M1	87		
				88		
				89		
				90		
				91		

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
TACOM	DE62	4073	REPL OF ELECTRON BEAM WELD BY LASER WELD F/ACT-1500 COMP	87	150	60
				88	939	
				89	900	
				90	400	
				91	200	
		4092	ROBOTIC WELDING FOR M113 REBUILD	88	350	60
				89	200	
		4093	DRY ICE BLAST FOR PAINT REMOVAL	88	300	61
				89	100	
		4094	PLASMA-MIG WELDING FOR ALUMINUM ARMOR	88	200	61
				89	100	
		4095	WEAVE-TYPE WELDING FOR STEEL ARMOR	88	300	61
				89	100	
		5005	COLD FORGED GEARS TO DRAWING TOLERANCES	87	1000	61
		6057	M-1 COMBAT VEHICLE-MFG TECHNOLOGY	87	575	61
TACOM	DE64	6107	APPL OF HAUFELD STEELS TO M1 MBT TRACK SUSPENSION COMPONENT	88	390	62
				87	150	
		6125	WELD PROCESS PLANNING AND CONTROL	88	148	62
				87	105	
		4001	MANUFACTURING FOR CORROSION PREVENTION	87	200	80
				88	200	
				89	200	
				90	200	
				91	200	
		4012	LASER VIBRATION DEPOT INSPECTION SYSTEM	87	473	80
				88	526	
		4090	CELL 9 POWER AND INERTIA SIMULATOR	87	87	80
				88	1768	
				89	1189	

MMT COMMAND INDEX

COMMAND	PROJECT	TASK	TITLE	FY	COST	PAGE
TACOM	DE64	5004	COMPOSITE/NON-METALS F/PROTOTYPE/LOW VOLUME PRODUCTION	87	163	80
				88	350	
				89	325	
				90	100	
TACOM	DE66	4091	TACOM LABORATORY MODERNIZATION PLAN	88	100	84
TECOM	DE51	5071	TEST OPERATIONS PROCEDURES	87	250	36
				88	257	
				89	252	
				90	255	
				91	261	
		3116	DYNAMIC ELECTRICAL MEASUREMENT STANDARDS	89	100	36
				90	100	
		3117	D.C. RESISTANCE METROLOGY	89	53	36
				90	90	
TMDE	DE51	3118	PHYSICAL MEASUREMENT STANDARDS	87	40	36
				88	46	
				89	180	
				90	180	
		3120	SOLID-STATE THERMAL CONVERTERS	87	40	37
				90	40	
		3121	TRANSPORTABLE 10 VOLT D.C. STANDARDS	90	50	37
		3796	COMBAT VEHICLE DEPERMING PRODUCTION FACILITY	87	50	37
				88	1465	
				89	1568	
				90	2300	
TROSCOM	DE51			91	3665	
		3802	HIGH STABILITY TRUSS CHORD	87	300	37
		3803	EFFICIENT FABRICATION OF EXTRUDED MAT PANELS	87	97	38
				89	100	



DE 50 COMMUNICATIONS/ELECTRONICS

DESO
COMAND FUNDING SUMMARY
(THOUSANDS)

COMAND	FY87	FY88	FY89	FY90	FY91
CECOM	225	875	539	555	584
DESCOM	2304	0	0	0	0
LACCOM	630	0	0	0	0
TOTAL	3159	875	539	555	584

 C U M M A N C

 L E C O M

AMT PROGRAM PLAN

FUNDING (\$,000)				
07	86	69	90	91
225	325	900	0	0

(3180) TITLE - ROBOTIC CONTROL OF LASER WELDING

PROBLEM - EQUIPMENT RACKS USED TO MOUNT ELECTRONIC SYSTEMS IN MOBILE SHELTERS ARE FORCED BY WELDING. DUE TO HEAT THE PRESENT WELDING TECHNIQUES CAUSE FRAME DISTORTION BEYOND TOLERANCES. IN ADDITION QUALITY WELDERS ARE NOT AVAILABLE.

SOLUTION - ESTABLISH AND IMPLEMENT TECHNIQUES FOR USING HIGH POWERED LASERS UNDER AUTOMATIC ROBOTIC CONTROL FOR WELDING. CONCENTRATED HEAT WILL PREVENT RACK HEATUP AND DISTORTION. CONTROL ROUTINE WILL BE REPEATABLE, AND EASILY CHANGED FOR OTHER CONFIGURATION.

(3186) TITLE - NIGHT VISION/LASER OPTICAL-REPAIR

PROBLEM - CURRENT MANUAL TEST, DIAGNOSIS AND REPAIR CAPABILITIES FOR IMAGE INTENSIFIER BASED NIGHT VISION SYSTEMS AT SAAC ARE INADEQUATE RESULTING IN SEVERAL ITERATIONS OF TEAR DOWN AND REPAIR TO COMPLETE A UNIT.

SOLUTION - A STAND ALONE WORKCELL OF FLEXIBLE AUTOMATION IS PROPOSED. SYSTEM WOULD DIAGNOSE FAILURE TO REPLACEABLE COMPONENT, DISASSEMBLE OPTICS, REPLACE COMPONENT AND REASSEMBLE. ALIGNMENT AND TEST CAPABILITY WOULD ASSURE ONE ITERATION.

(3194) TITLE - ROBOTIC CONTROL OF PLATING

PROBLEM - COPPER PLATING BATHS FOR PRINTED CIRCUIT BOARDS AT TOSYHAMA DEPUT USE MANUAL PROCEDURES FOR ADDING, MEASURING & CONTROLLING BATH CONSTITUENTS. ENVIRONMENT IS A PERSONNEL HAZARD AND HIGHLY INEFFICIENT.

SOLUTION - ROBOTICS WILL BE USED TO PROVIDE UNIFORM PARTS MOVEMENT THROUGH THE PLATING BATHS. MICROPROCESSOR CONTROLLED MEASUREMENT & AUTOMATED AGENT ADDITIVE TECHNIQUES WILL BE INCORPORATED.

MMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

(6005) TITLE - MATERIAL TRACKING USING MICROCLIPS

PROBLEM - RECORDING, REPORTING AND TRANSFER OF DETAILED INFORMATION ON MATERIAL/WEAPON SYSTEM TO THE PRODUCTION AND LOGISTICS COMMUNITY IS LABOR INTENSIVE.

SOLUTION - TO APPLY MICROCHIP TRACKING/REPORTING TECHNIQUES TO INVENTORY, SUPPLY, AND MAINTENANCE FOR ARMY SYSTEMS.

C U M M A N D

L A U C U M

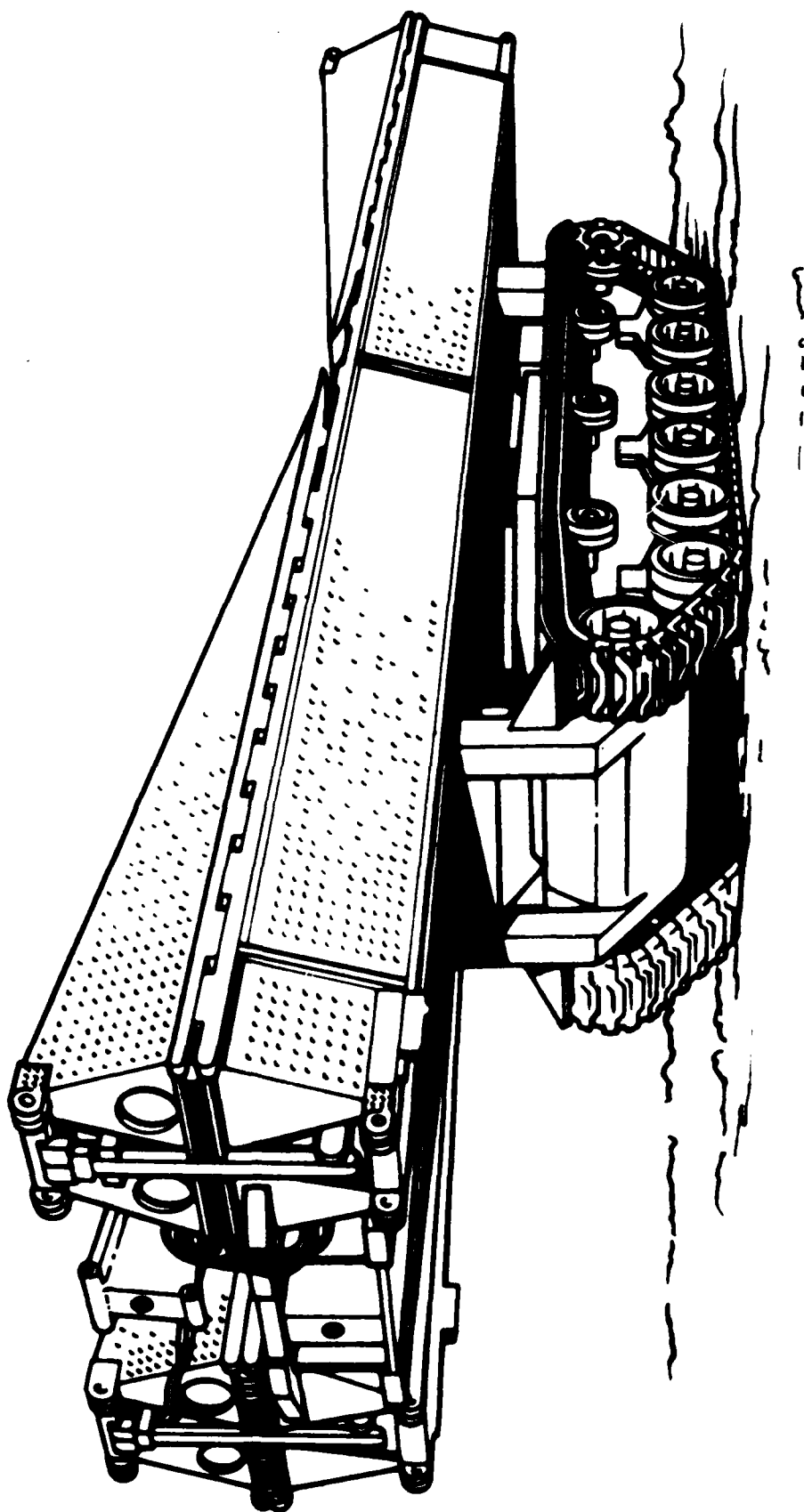
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(6006) TITLE - RESOLVING MFG ISSUES IN DUD-STD-2000, INFRA-RED + X-RAY

PROBLEM - DUD-STD-2000 SOLDERING SPECIFICATION DOES NOT ADDRESS AUTOMATED SOLDER JOINT INSPECTION TECHNIQUES. VANZETTI LASER SOLDER INSPECTION MACHINE + IRT X-RAY SOLDER INSPECTION MACHINE CAN BE USED ON GOVT CONTRACTS ONLY WITH WAIVERS

SOLUTION - SOLDER JOINT PERFORM REQS WILL BE CHARACTERIZED. CERTIFICATION CRITERIA FOR VANZETTI LASER SOLDER INSPECT MACHINE + IRT X-RAY SOLDER INSPECTION MACHINE WILL BE WRITTEN. DUD-STD-2000 WILL BE AMENDED ARMY-WIDE.

630 0 0 0 0



DE 51 OTHER SUPPORT EQUIPMENT

DESIGN
SUMMARY
FUNDING
(THOUSANDS)

COMPANY	FY87	FY88	FY89	FY90	FY91
AML	400	148	336	326	0
APCCN	1149	1654	1618	1644	1603
LPOCUM	1119	1286	1338	2601	0
TECON	250	257	252	255	261
TPDE	80	46	333	460	0
TRUSCOM	447	1465	1668	2300	3605
TOTAL	3445	4856	5545	7786	5609

MNT PROGRAM PLAN

 C M M A N U

 AML

FUNDING (\$000)

87 88 89 90 91

(0502) TITLE - ARMY ENGINEERING DESIGN HANDBOOK FOR PRODUCTION SUPPORT

400 148 336 326 0

PROBLEM - NO EXISTING ARMY PROGRAM PROVIDES FOR INITIATION, REVISION + UPDATING OF TECHNICAL DATA USED IN PRODUCTION + PROCUREMENT OF MILITARY HARDWARE, SOFTWARE + EGMT WITHIN THE SHORT TIMEFRAME ESTABLISHED BY THIS EFFORT.

SOLUTION - TO PROVIDE NEW, REVISED + UPDATED TECHNICAL + SCIENTIFIC DATA SET IN PRODUCTION + PROCUREMENT OF MILITARY HARDWARE + EQUIPMENT.

 C M M A N U

 AML

(0916) TITLE - MODERNIZATION OF FILTER PENETRATION EQUIPMENT

250 460 0 0 0

PROBLEM - CURRENTLY, ALL PROTECTIVE PARTICULATE FILTERS ARE TESTED WITH THREE TYPES OF EQUIPMENT. THIS EQUIPMENT IS OBSOLETE, INEFFICIENT, AND UNRELIABLE.

SOLUTION - DEVELOP PROTOTYPE TESTERS WITH SOLID STATE COMPONENTS UTILIZING STATE OF ART TECHNOLOGY.

(0923) TITLE - VELOCITY TRAVERSE MAPPER FOR CHARCOAL FILTERS

100 100 0 0 0

PROBLEM - GAS FILTERS MUST BE MONITORED DURING THE MANUFACTURING PROCESS TO ASSURE THE INTEGRITY OF THE CHARCOAL BED BEFORE ASSEMBLY.

SOLUTION - A VELOCITY TRAVERSE TECHNIQUE WILL BE ADAPTED TO MEASURE AIR VELOCITIES THROUGH ANNULAR CHARCOAL FILTERS.

(0926) TITLE - MNT FOR XM22 CHEMICAL AGENT ALARM SYSTEM

271 150 0 0 0

PROBLEM - A CHEMICAL AGENT ALARM SYSTEM, XM22 IS CURRENTLY UNDER DEVELOPMENT TO PROVIDE CAPABILITY OF CHEMICAL DEFENSE. COMPLEX COMPONENTS IN THE ALARM ARE DIFFICULT TO PRODUCE AND LACK AVAILABLE HIGH PRODUCTION TECHNIQUES.

SOLUTION - ESTABLISH METHODS TO PRODUCE THE COMPLEX COMPONENTS OF THE XM22 ALARM AND INSURE MASS PRODUCTION AND DOCUMENT THE DESCRIPTION OF MANUFACTURE.

MMT PROGRAM PLAN

FUNDING (\$JOG)

67 86 89 90 91

COMPAG -- AMCCOM

(CONTINUED)

(0931) TITLE - MMT FOR ANTIDOTES FOR DETECTION SYSTEMS

PROBLEM - THE USE OF ANTIDOTES TO DETECT CHEMICAL AND BIOLOGICAL AGENTS HAS NOT BEEN ESTABLISHED AS A PRODUCTION PROCESS.

SOLUTION - A PRODUCTION BASELINE WILL BE ESTABLISHED FOR ANTIDOTES TO SUPPORT THE PRODUCT IMPROVED M272 AND M256 KITS.

(0941) TITLE - MODERNIZATION OF AEROSOL AGENT TEST EQUIPMENT

PROBLEM - CURRENTLY THE LIQUID AGENT DETECTOR PAPER IS TESTED WITH OBSOLETE EQUIPMENT BASED ON 1940S TECHNOLOGY.

SOLUTION - A MODERNIZED TESTER WILL BE DEVELOPED BASED ON STATE-OF-THE-ART TECHNOLOGY OF MANUALLY DISPENSED AEROSOL GENERATION.

(0942) TITLE - IMPROVED PENETRATION FILTER TEST EQUIPMENT

PROBLEM - THE CURRENT FAMILY OF PENETRATION TEST EQUIPMENT FOR FILTERS CONSISTS OF THE Q127, Q107, Q76 AND Q233. EFFORTS ARE BEING ACCOMPLISHED FOR THE Q127 AND Q107 TESTERS.

SOLUTION - EFFORTS WILL BE ACCOMPLISHED TO UPGRADE THE Q76 AND Q233 PENETRATION TEST EQUIPMENT.

(0943) TITLE - AUTOMATED PENETRATION INDICATOR SYSTEM

PROBLEM - CURRENTLY AGENT PERMEATION TESTING OF PROTECTIVE MATERIALS IS ACCOMPLISHED BY CONTROLLING WITH A COMPUTER. BOTH HARDWARE AND THE SOFTWARE ARE INADEQUATE FOR THE PROJECTED VOLUME OF MATERIAL TESTING.

SOLUTION - A PROTOTYPE WILL BE DEVELOPED FOR AUTOMATIC PERMEATION TESTING OF MULTIPLE PROTECTIVE MATERIAL TEST CHAMBERS USING A SINGLE HYFED ANALYZER.

(0944) TITLE - GAS TECHNOLOGY APPLIED TO PRODUCTION MASK TESTER

PROBLEM - THE VALIDITY OF CURRENT TEST EQUIPMENT USING AEROSOLS TO CHALLENGE GAS MASKS IS QUESTIONABLE. THIS IS DUE TO THE SIZE OF THE LIQUID AEROSOL BEING LARGER THAN THE MINIMUM DIMENSION OF A LEAK PATH IN A DEFECTIVE MASK.

SOLUTION - TEST EQUIPMENT USING GAS TECHNOLOGY WILL BE DEVELOPED TO LEAK TEST MASKS.

0 0 0 0 150 0

200 500 300 510 900

0 0 0 250 0

0 0 300 0 0

0 0 0 100 0 0

MNT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPAND -- ANCCOM

(CONTINUED)

(10949) TITLE - MANUFACTURING TECHNOLOGY FOR ENZYME FOR DETECTION SYSTEMS 0 0 768 884 783

PROBLEM - FULL SCALE PRODUCTION PROCESSES HAVE NOT BEEN ESTABLISHED FOR ENZYMES USED TO DETECT CHEMICAL AGENTS, BIOLOGICAL AGENTS, AND TOXINS.

SOLUTION - PERFORM PROCESS ENGINEERING TO ESTABLISH FULL SCALE PRODUCTION OF HEAT STABILIZED ENZYMES FOR USE IN DETECTOR KITS.

(11295) TITLE - MOD OF CHARCOAL FILTER TEST EQUIPMENT 328 638 0 0 0

PROBLEM - CHARCOAL FILTER TESTING EQUIPMENT NEEDED TO PROVIDE TESTING CAPABILITY FOR VARIOUS CHEMICAL AGENTS DOES NOT EXIST.

SOLUTION - DESIGN A MODULAR TESTING SYSTEM FOR VARIOUS FILTER SYSTEMS.

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(16550) TITLE - MANUFACTURING TESTING TECHNOLOGY PROGRAM 993 1036 1088 2551 0

PROBLEM - DESTRUCTIVE AND CERTAIN CONVENTIONAL NON-DESTRUCTIVE TESTING TECHNIQUES ARE RESPECTIVELY UNSUITED AND INADEQUATE OR HARD TO BE ADAPTED TO ON-LINE PRODUCTION TESTING USAGE.

SOLUTION - DETERMINE FEASIBILITY OF ADAPTING PROVEN BUT METHODS OR MODIFYING THE EXISTING TEST PROCEDURES FOR ON-LINE PRODUCTION QUALITY ASSURANCE TESTING.

(16594) TITLE - PROGRAM IMPLEMENTATION AND INFORMATION TRANSFER 126 250 250 250 0

PROBLEM - THE SUCCESS OF THE MNT PROGRAM IS VERY DEPENDENT ON WHETHER THE RESULTS OF MNT WORK GET IMPLEMENTED. THIS IN TURN IS DEPENDENT ON WHETHER INFORMATION CONCERNING THE MNT TECHNOLOGY IS MADE AVAILABLE AND USED BY CONCERNED PARTIES.

SOLUTION - INSURE THAT THE MNT RESULTS ARE DOCUMENTED AND GIVEN WIDE DISTRIBUTION SO AS TO ENCOURAGE IMPLEMENTATION.

MNT PROGRAM PLAN

 C U M M A N D

 TELCOM

FUNDING (\$000)

87 88 89 90 91

(5071) TITLE - TEST OPERATIONS PROCEDURES

250 257 252 255 261

PROBLEM - ARTILLERY, VEHICLE, AND ELECTRONIC CONVENTIONAL TEST PROCEDURES NEED TO BE UPGRADED FOR ACCEPTANCE TEST PROCEDURES AND TEST OPERATION PROCEDURES.

SOLUTION - DEVELOP A PROGRAM TO UPGRADE TEST PROCEDURES AT THE PROVING GROUNDS.

 C U M M A N D

 TELCOM

(3116) TITLE - DYNAMIC ELECTRICAL MEASUREMENT STANDARDS

0 0 0 100 100 0

PROBLEM - THE HARDWARE AND SOFTWARE OF AUTOMATED CALIBRATION STATIONS REQUIRE CONTINUOUS UPDATING. A LARGE AMOUNT OF TECHNOLOGY INVESTIGATION IS REQUIRED TO UPDATE THE HARDWARE AND SOFTWARE NEEDED TO MAINTAIN AUTOMATED TRADE.

SOLUTION - CONTINUOUS MONITORING OF ADVANCED AUTOMATED TECHNOLOGY AND QUICK RESPONSE TO NEW REQUIREMENTS. THE FOLLOWING ACTION WILL BE TAKEN: ASCERTAIN SUPPORT REQUIREMENTS; PRODUCE & INSTALL HARDWARE; WRITE NEEDED SOFTWARE PROGRAMS AND MODIFY CURRENT SOFTWARE.

(3117) TITLE - D.C. RESISTANCE METHODOLOGY

0 0 0 53 90 0

PROBLEM - THE PRESENT METHOD OF CALIBRATING STD RESISTORS AT ARMY PRIMARY LEVELS IS TEDIOUS AND TIME-CONSUMING. THE RESISTANCE STDs ARE TOO SUSCEPTIBLE TO ENVIRONMENTAL FACTORS TO ADEQUATELY SUPPORT HIGH ACCURACY RESISTANCE MEASURING DEVICES AT LOWER ELMENTS.

SOLUTION - ESTABLISH A NEW CLASS OF HIGHLY ACCURATE DC RESISTANCE STDs THAT ARE LESS SUSCEPTIBLE TO ENVIRONMENTAL FACTORS. EXTEND AUTO-CAPABILITY NOW PRESENT FOR THE 1 OHM STD TO RANGES UP TO 1 MEGOHM. NBS HAS 1 OHM CAPABILITY, REPEAT ABOVE FOR ARMY STDs LAB.

(3118) TITLE - PHYSICAL MEASUREMENT STANDARDS

40 40 180 180 0

PROBLEM - THE NM TECHNIQUES REQUIRED TO PRODUCE THE PHYSICAL MEASUREMENT STANDARDS IN SUPPORT OF THE CALIBRATION PROGRAM REQUIRES CONTINUOUS UPDATING TO KEEP UP W/CHANGING TECH. CALIBRATION TECHNIQUES MUST BE DEVELOPED TO HELP KEEP THE ARMY'S STATE OF READY.

SOLUTION - TO ESTABLISH OR IMPROVE PHYSICAL MEASUREMENT MFG. PROCESSES, TECHNOLOGY AND EQUIPMENT FOR ADVANCED SYSTEMS AND COMPONENTS REQUIRED TO SUPPORT THE ACCURACY SPECIFICATIONS OF ARMY TRADE.

MMT PROGRAM PLAN

FUNDING (\$000)			
67	68	69	90
87	86	89	90
91			

COMPANC -- TMDr (CONTINUED)

(3120) TITLE - SOLID-STATE THERMAL CONVERTERS

PROBLEM - ARMY STANDARDS AND CALIBRATION SYSTEM ARE INADEQUATE.

SOLUTION - CONSTRUCT AND EVALUATE THERMAL CONVERTER SYSTEMS.

(3121) TITLE - TRANSPORTABLE 10 VOLT D.C. STANDARD

PROBLEM - DUE TO THE HIGHLY CRITICAL NATURE OF DC VOLTAGE MEASUREMENTS THE FUTURE GENERATION OF DC VOLTAGE MEASURING AND GENERATING EQUIPMENT WILL REQUIRE MAJOR ADVANCES IN THE NATIONAL STANDARD OF VOLTAGE BEING MAINTAINED AT NBS.

SOLUTION - DEVELOP A RUGGED TRANSPORTABLE 10V STD W/GOOD SHORT-TERM PRECISIBILITY BASED ON IMPROVEMENTS IN ZENER DEVICES. THIS WILL ALLOW EFFICIENT TRANSFER OF THE STD TO LOWER LEVEL ECHELON LABORATORIES.

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• TRUSCORP •

(3796) TITLE - COMBAT VEHICLE DEPERMING PRODUCTION FACILITY

PROBLEM - PRESENT DESIGN AND FABRICATION TECHNIQUES FOR VEHICLES RESULT IN A SIGNIFICANT MAGNETIC SIGNATURE. THIS MAGNETIC SIGNATURE CAN BE USED TO FUZE LAND MINES TO ATTACK THE VEHICLE UNDERCARRIAGE.

SOLUTION - CONSTRUCT A PILOT DEPERMING PRODUCTION FACILITY THAT WILL ALLOW DEVELOPMENT OF A DEPERMING TECHNIQUE FOR US ARMORED VEHICLES.

(3802) TITLE - HIGH STABILITY TRUSS CHORD

PROBLEM - USE OF BRAIDED GRAPHITE TO MAKE POSSIBLE STRONG BRIDGE SECTIONS HAS BEEN DEMONSTRATED. BUT, BARRIER TO USING BRAIDING IN PRODUCTION IS THAT A RELIABLE METHOD OF IMPREGNATING FIBERS WITH RESIN DOES NOT EXIST.

SOLUTION - THIS PROGRAM WILL INVESTIGATE A MECHANIZED SYSTEM TO CONTINUOUSLY IMPREGNATE FIBERS DURING BRAIDING. A PILOT LINE WILL BE SET UP TO DEMONSTRATE THE PRODUCTION OF TRUSS CHORDS.

50	1465	1508	2300	3665
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300	0	0	0	0
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MHT PROGRAM PLAN

FUNDING (\$000)				
87	88	89	90	91

COMPANC -- TRCSCOM

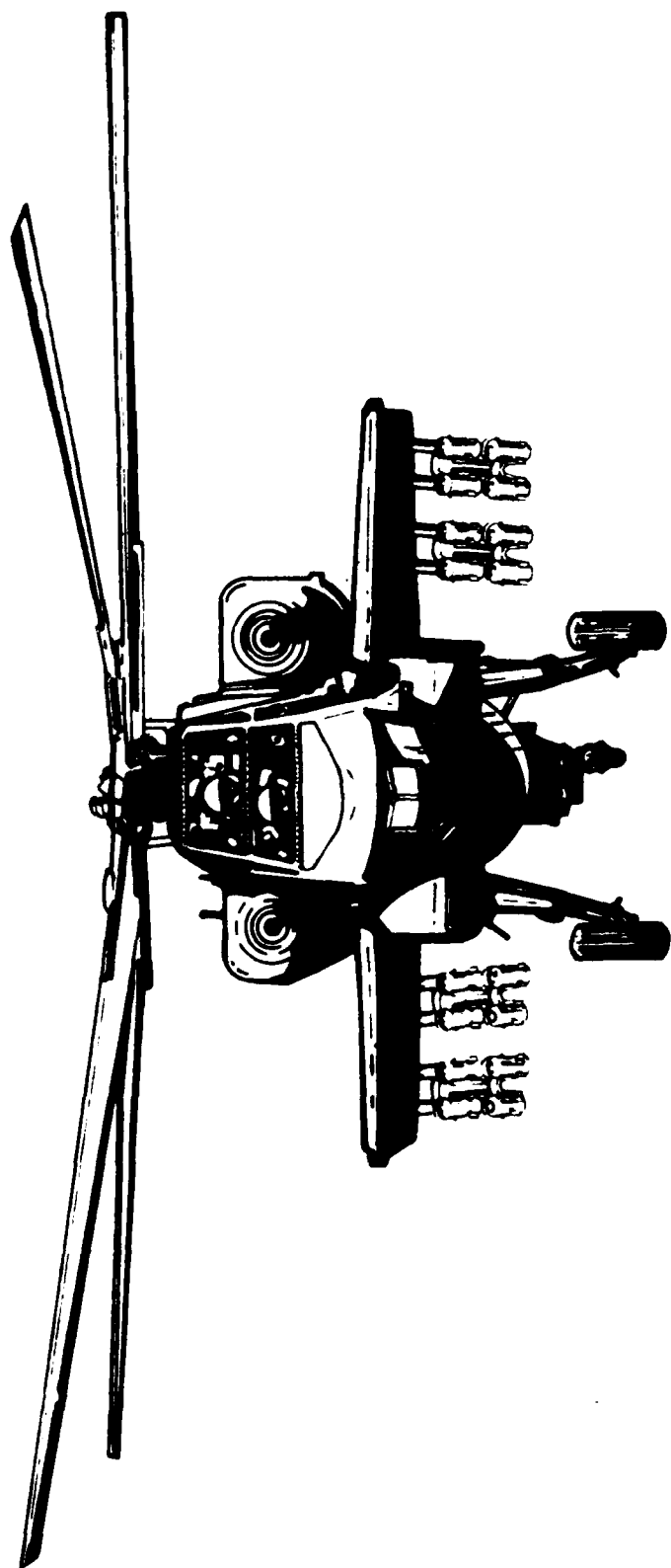
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(3803) TITLE - EFFICIENT FABRICATION OF EXTRUDED MAT PANELS.

PROBLEM - ALUMINUM BELKS AND MATS ARE LARGE EXTRUSIONS THAT ARE AVAILABLE FROM A DECLINING NUMBER OF SOURCES. AVAILABILITY OF SMALL EXTRUSIONS IS GOOD BUT METHODS FOR PREPARING A FINISHED WELDMENT FROM THEM ARE NOT QUALITY/COST EFFECTIVE.

SOLUTION - THIS PROGRAM WILL PERFECT THE WELDING, INSPECTION, AND MANUFACTURING PROCESSES NEEDED TO ALLOW USE OF SMALLER, MORE READILY AVAILABLE EXTRUSIONS.

97	0	100	0	0
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**DE 60
AIRCRAFT**

DE60

COMMAND FUNDING SUMMARY
(THOUSANDS)

COMPAND	FY87	FY88	FY89	FY90	FY91
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AVSCEN	353	490	423	446	470
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TOTAL	353	490	423	446	470

MNT PROGRAM PLAN

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 C O M M A N D

 A V S C O M

FUNDING (\$000)

87 88 89 90 91

(7456) TITLE - LOW COST TOOLING FOR AIRFRAME AND ROTOR COMPONENTS

0 0 0 446 470

PROBLEM - HIGH COST METAL TOOLING CONCEPTS OR EXPENSIVE AUTOCLAVE CURING APPROACHES HAVE BEEN USED WHICH RESULT IN EXTENDED CURE CYCLES AND POOR ENERGY CONSERVATION.

SOLUTION - ESTABLISH TECHNOLOGY FOR THE USE OF SELF-CONTAINED INTEGRALLY HEATED PLATEIN PRESS TOOLING. THIS WILL ALLOW COMPOSITE COMPONENTS TO BE FABRICATED AT LOW COST DUE TO RAPID CURE TIME AND PRODUCTIVITY.

(7551) TITLE - COMPUTER INTEGRATED MFG (CIM) FACTORY DESIGN SYSTEM

353 90 423 0 0

PROBLEM - CURRENT AIRCRAFT ENGINE MANUFACTURING METHODS AND CONTROLS RESULT IN HIGH IN-PROCESS INVENTORIES, LONG LEAD TIMES AND REDUCIBLE MANUFACTURING COSTS. THERE IS A NEED FOR A COMPUTER AIDED CAPABILITY TO COST EFFECTIVELY APPLY CIM PRINCIPLES.

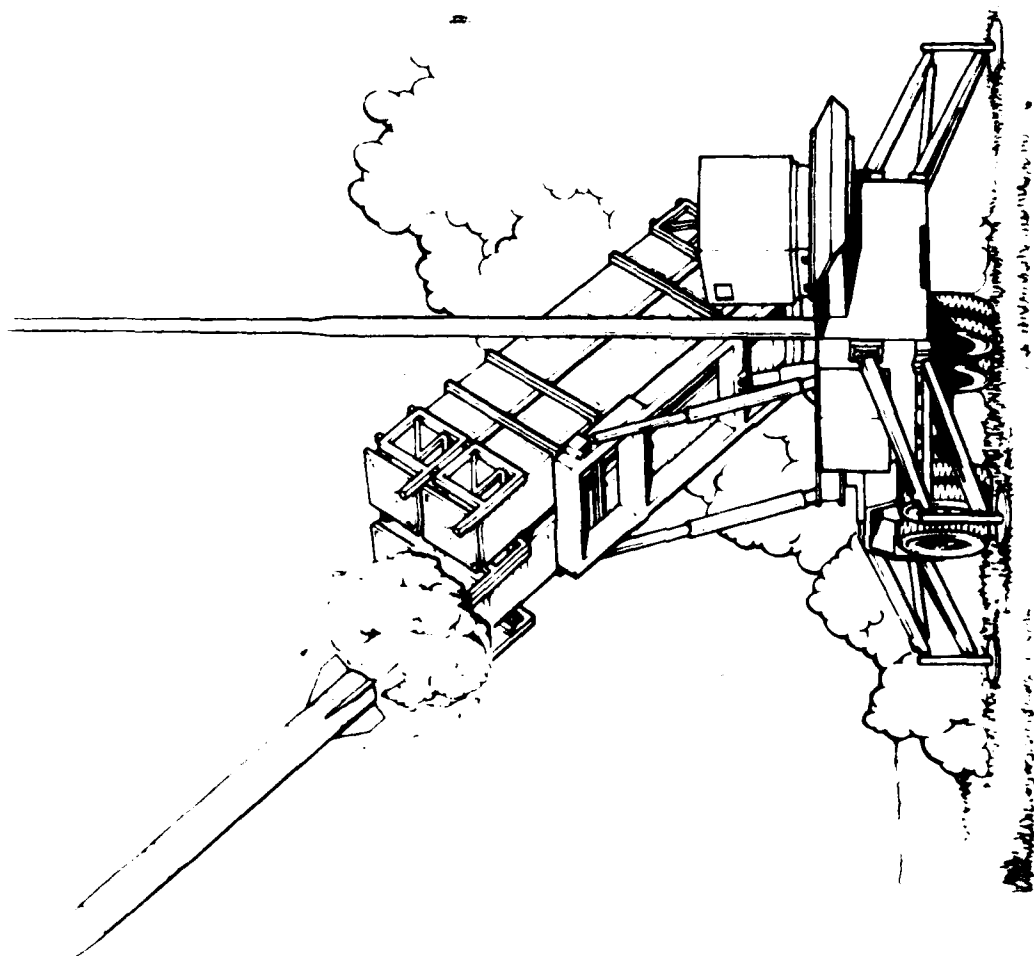
SOLUTION - DEVELOP AND VALIDATE A CIM FACTORY DESIGN SYSTEM. USE LOGIC CAPTURING SOFTWARE TO LEAD THE MFG DESIGNER THROUGH THE DESIGN OF CIM CELLS. THE METHODOLOGY WILL ASSIST IN THE DESIGN OF CIM CELLS AND WILL ACT AS A DECISION MAKING TOOL.

(7562) TITLE - PROGRAMMABLE ELECTRONIC TORQUE WRENCH F/AERIALSPACE APPLICATION

0 400 0 0 0

PROBLEM - CURRENT MECHANICAL AND ELECTRONIC TORQUE WRENCHES ARE SLOW IN USE, REQUIRE PERIODIC RECALIBRATION, ARE NOT ACCURATE ENOUGH, OR ARE BULKY. ALSO, INSPECTORS ARE REQUIRED ON THE SPOT FOR CRITICAL APPLICATIONS.

SOLUTION - FABRICATE AND ESTABLISH PROCESSES FOR A PROGRAMMABLE ELECTRONIC TORQUE WRENCH.



**DE 61
MISSILES**

DE 61

COMMAND FUNDING SUMMARY
(THOUSANDS)

COMPANU	FY87	FY88	FY89	FY90	FY91
WICOM	822	1306	1686	868	1274
TOTAL	822	1306	1686	868	1274

MMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

(1109) TITLE - ROBOTIZED WIRE HARNESS ASSEMBLY SYSTEM

PROBLEM - MANUAL HARNESS PROCEDURES UTILIZE SEVERAL STATIONS & SIGNIFICANT REPEATED MATERIAL HANDLING & TRANSFER. APPROXIMATELY 80 PERCENT OF FABRICATION TIME IS DEVOTED TO HANDLING, SORTING, AND IDENTIFICATION.

SOLUTION - AN INTEGRATED APPROACH TOWARDS WIRE HARNESS FABRICATION WILL USE A ROBOT ARM WITH 6 DEGREES OF FREEDOM TO INCORPORATE WIRE PREPARATION, HARNESS ASSY, AND TESTING INTO A SINGLE WORK STATION.

(1147) TITLE - OPTICAL FIBER WINDING

PROBLEM - CURRENT OPTICAL FIBER WINDING SYSTEMS CANNOT CONTINUOUSLY MONITOR AND CONTROL THE WINDING CHARACTERISTICS REQUIRED. ALSO REPAIR OF A BROKEN FIBER IN THE WINDING PROCESS IS NOT POSSIBLE.

SOLUTION - THE FIBER WINDING SYSTEM BEING DEVELOPED WILL BE COMPLETED ALLOWING FULL CONTINUOUS MONITORING AND CONTROL OF ALL PROCESS PARAMETERS. IN-PROCESS REPAIR TECHNOLOGY WILL BE INCORPORATED INTO THE CURRENT DESIGN.

(1202) TITLE - CHEAP RAPID OPTICAL FABRICATION TECHNOLOGY (CROFT)

PROBLEM - NEW MIRROR FABRICATION TECHNOLOGY IS EMERGING FROM R+D AND NEEDS TO BE MODIFIED FOR THE PRODUCTION ENVIRONMENT. THERMALLY STABLE COMPOSITES AND LARGE AREA UNIFORM COPPER DEPOSITION NEEDS DEVELOPMENT.

SOLUTION - HIGH PRODUCTION RATE AND LOW COST TECHNOLOGY WILL BE DEVELOPED FOR DAMAGE RESISTANT COATINGS, COPPER DEPOSITION AND CARBON-GLASS THERMALLY STABLE COMPOSITE SUBSTRATE MIRRORS FOR USE IN DIRECTED ENERGY WEAPONS.

(1221) TITLE - CIM TECHNIQUES FOR MISSILE HYBRID MICROELECTRONIC ASSEMBLIES

PROBLEM - MILITARY HYBRID CIRCUITS ARE COSTLY AND HAVE LOW YIELD BECAUSE THEY ARE MADE BY LOW VOLUME METHODS. THEY ALSO HAVE HIGH PERFORMANCE REQUIREMENTS.

SOLUTION - EVALUATE CURRENT CAD/CAM PRACTICE AND EQUIPMENT. DEVELOP A CIM SYSTEM THAT INTEGRATES DESIGN, MANUFACTURE AND TEST, USING A SINGLE DATA BASE. DEVELOP A DESIGN-TO-COST MODEL. AUTOMATE DIE TESTING, PART KITTING, MTL HANDLING. IMPLEMENT AND DEMONSTRATE.

200 676 0 0 0

622 690 718 0 0

0 0 0 0 1274

0 0 250 0 0

HMT PROGRAM PLAN

FUNDING (\$000)				
87	88	89	90	91

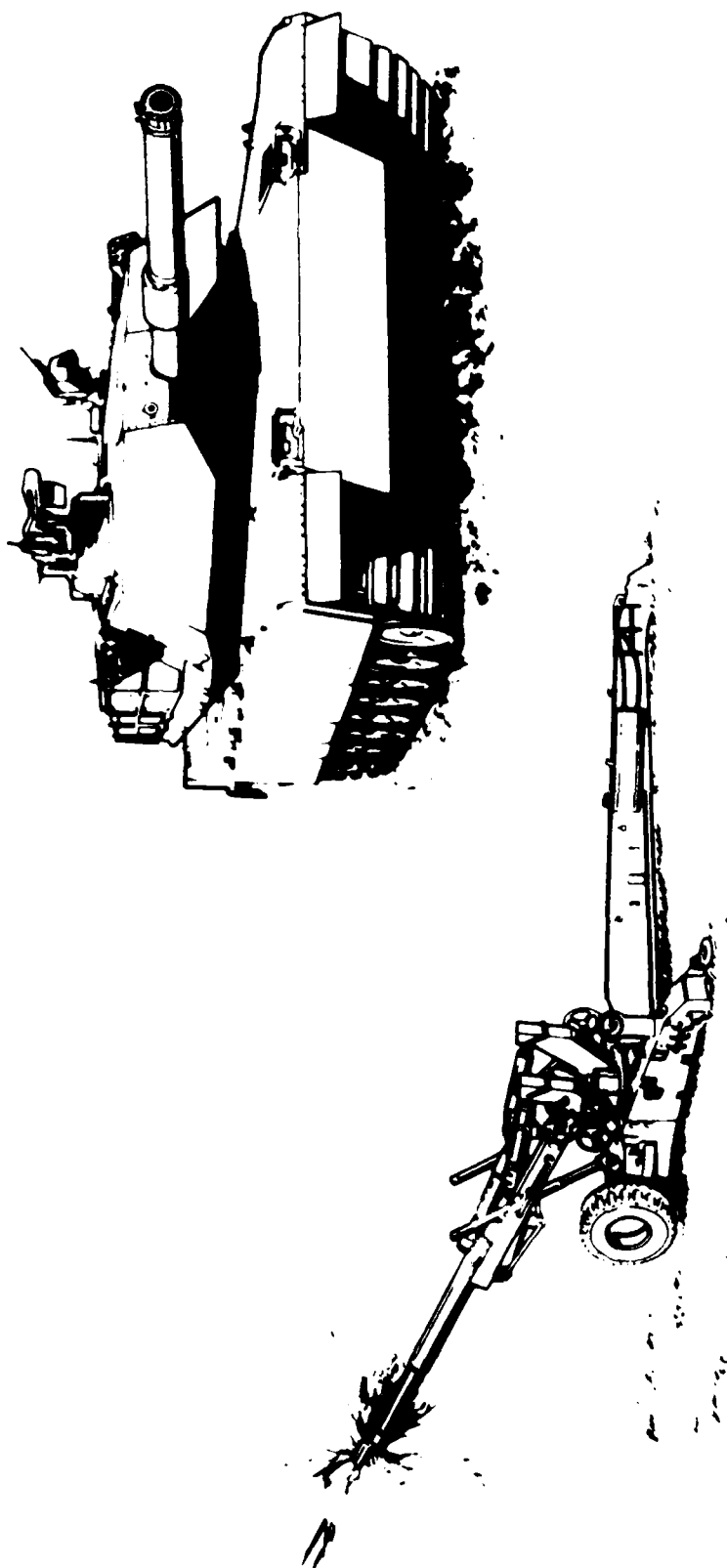
COMPAND -- MICCM

(CONTINUED)

(2036) TITLE - ROBOTIZED WIRE HARNESS ASSEMBLY SYSTEMS ENHANCEMENTS	0	0	718	868	0
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PROBLEM - MUST HARNESS MANUFACTURING TECHNIQUES ARE LABOR INTENSIVE, CHARACTERIZED BY MANUAL ASSEMBLY, MULTIPLE WORKSTATIONS, CONSIDERABLE MATERIAL HANDLING AND A HIGH REJECT/REWORK RATE.

SOLUTION - COMPLETED HMT PROJECT 1109 PROVIDED FLEXIBLE AUTOMATION AND ROBOTICS TO ACHIEVE A 50 PERCENT REDUCTION IN WIRE HARNESS COST. THIS SYSTEM CAN RETURN GREATER SAVINGS BY ADDING TWISTED PAIR AND SHIELDED CABLE CAPABILITIES.



DE 62
WEAPONS AND TRACKED COMBAT
VEHICLES

DE 62

COMMAND FUNDING SUMMARY
(THOUSANDS)

COMMAND	FY87	FY88	FY89	FY90	FY91
AMCCUM	1570	3295	2597	3008	3124
DESCUM	400	1110	240	300	0
TACOM	2105	2805	1400	400	200
TOTAL	4083	7210	4237	3708	3324

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MNT PROGRAM PLAN

FUNDING (\$000)

07 88 89 90 91

50 0 0 0 0

(17985) TITLE - SMALL ARMS WEAPONS NEW PROCESS PRODUCTION TECHNOLOGY

PROBLEM - GUN BARREL MFG PROCEDURES REFLECT ANTICATED TECHNOLOGY AND RELY ON MASS REMOVAL OF MATERIAL BY CONVENTIONAL MACHINING METHODS. CURRENT EQUIP REPRESENTS 1940-50 TECHNOLOGY. NEW MATERIALS COMPOUND THE PROBLEM.

SOLUTION - NEED TO PRACTICE NEW TECHNIQUES FOR ALL SMALL CALIBER WEAPONS BARRELS BY ESTABLISHING THE TECHNOLOGY AND PROCESS EQUIPMENT REQUIRED TO BRIDGE GAP BETWEEN CAPABILITIES & REQUIREMENTS.

(18120) TITLE - ADAPTIVE CONTROL TECHNOLOGY

PROBLEM - CURRENT GRINDING PROCESSES DO NOT TAKE ADVANTAGE OF THE GRINDING WHEEL CUTTING EFFICIENCY. PRECISION TOLERANCES ARE DIFFICULT TO HOLD DUE TO PART HEATING. WHEEL WEAR RATES INCREASE EXPONENTIALLY WITH FEED RATES AND LIMIT PRODUCTIVITY.

SOLUTION - USE A PROCESS CALLED ENERGY ADAPTIVE GRINDING. IT USES AN ADAPTIVE CONTROL, FITTED TO A CYLINDRICAL GRINDER. WHEEL SPEED, WHICH DETERMINES WHEEL SHARPNESS WHICH EFFECTS METAL REMOVAL RATES AND EFFICIENCY, IS CONTROLLED.

(18211) TITLE - MANUFACTURE OF MOLDED GLASS LENSES

PROBLEM - THE OPTICAL MANUFACTURING PROCESS INVOLVES CUTTING, GRINDING, LAPPING, AND POLISHING GLASS. THE PROCESS, DIAMOND SAWING, ROUGH GRINDING, AND POLISHING IS WASTEFULL OF OPTICAL QUALITY GLASS AND LABOR.

SOLUTION - BY MOLDING GLASS SHAPES A CONSIDERABLE AMOUNT OF EXPENSIVE LABOR AND MATERIAL CAN BE AVOIDED. A FINE CONTROL SYSTEM WILL BE CHOSEN FOR RETROFITTING WITH ASPHERICAL LENSES.

(18231) TITLE - IMPROVED CASTING TECHNOLOGY (CAJ/CAM)

PROBLEM - THE UNAVAILABILITY OF EXPERIENCED CASTING ENGINEERS OR COMPUTERIZED CASTING DESIGN RESULTS IN DESIGN BY TRIAL AND ERROR. CASTING YIELDS ARE TOO LOW. COMPLICATED CASTINGS ARE UNSOUND AND SUSCEPTIBLE TO HOT TEARS REQUIRING REPAIR WELDING.

SOLUTION - USING A CASTING DESIGN EXPERT SYS FOR STEEL CASTINGS, WITH FINITE ELEMENT FLUID FLOW AND THERMAL ANALYSIS PROGRAMS, TRIAL AND ERROR PROCEDURES WILL BE DECREASED, GATING AND RISEMING DESIGN WILL BE AUTOMATED. OCCURRENCE OF HOT TEARS WILL BE REDUCED.

0 200 200 0 0

0 0 50 0 100

0 195 335 0 0

MMT PROGRAM PLAN

FUNDING (\$000)

67 86 89 90 91

COMMAN -- ANCLON

(CONTINUED)

(8262) TITLE - PRODUCTION METHODS FOR OPTICAL WAVEGUIDES 50 73 53 0 0

PROBLEM - MANUFACTURE OF INTEGRATED WAVEGUIDES IS COMPLICATED AND TIME CONSUMING INVOLVING PROCESSES RELATED TO METHODS USED TO MAKE SEMICONDUCTOR INTEGRATED CIRCUITS.

SOLUTION - USE ION IMPLANTATION IN GALLIUM ARSENIDE PHOSPHIDE SUBSTRATES TO DIRECTLY FORM OPTICAL WAVEGUIDES IN A ONE-STEP PROCESS.

(8329) TITLE - FIRE CONTROL OPTICAL DEVICES NEW PROCESS PRODUCTION TECH 0 0 0 0 170 275

PROBLEM - FIRE CONTROL MANUFACTURERS PRODUCTION CAPABILITY DOES NOT MEET PLANNED PRODUCTION OR MIB REQUIREMENT.

SOLUTION - IDENTIFY AND RESOLVE PRODUCTION PROBLEMS AND BOTTLENECKS AND INVESTIGATE AND INTRODUCE FUTURE PRODUCTION TECHNOLOGY.

(8352) TITLE - SKIVING OF GUN TUBE BORES 0 135 135 0 0

PROBLEM - INTERMEDIATE TUBE BORE HONING OPERATIONS FOR SURFACE FINISH AND SIZE CONTROL IS A TIME CONSUMING, COSTLY METAL REMOVAL PROCESS. COUNTERBORING OPERATIONS PRIOR TO SAGE AUTOFRETTAGE ARE ALSO SLOW, TIME CONSUMING, AND HIGH IN TOOLING COSTS.

SOLUTION - THE APPLICATION OF RECENTLY DEVELOPED SKIVING TECHNOLOGY AND EQUIPMENT WILL ELIMINATE COSTLY ROUGH HONING AND COUNTERBORING OPERATIONS.

(8365) TITLE - PRODUCTION METHODS FOR RADIAL GRADIENT INDEX LENSES 0 0 0 50 50 100

PROBLEM - MUCH OF THE COST OF OPTICAL FIRE CONTROL SYSTEMS IS IN THE MFG OF THE OPTICAL ELEMENTS. THE MACHINING OF THEIR HOLDING FIXTURES AND THEIR ALIGNMENT AND ASSEMBLY INTO THE SIGHT. A SINGLE RADIAL GRADIENT INDEX (GRIN) LENS CAN REPLACE 3 STD LENSES.

SOLUTION - ESTABLISH TECHNIQUES FOR RADIAL GRIN LENS MFG SUCH AS ELECTRIC FIELD ASSISTED ION DIFFUSION AND THE SOL GEL PROCESS.

(8370) TITLE - AUTO INSPECTION + PROCESS CONTROL OF WEAPONS PARTS 40 0 0 0 0

PROBLEM - FOR BARREL MFG, CURRENT HAND CAGED INSPECTION IS A MAJOR TIME FACTOR. BARREL STRAIGHTENING IS ALSO DONE MANUALLY AS MANY AS 13 TIMES DURING THE MFG CYCLE. NEW DNC EQUIP BEING PROCURED VIA-PF 68X7986 REQUIRES CENTRAL CONTROL.

SOLUTION - AUTOMATE, TO MAX FEASIBLE DEGREE, INSPECTION OPERATIONS. USING LASER TECHNOLOGY. EQUIP A STRAIGHTENING PRESS WITH FEEDBACK CONTROL TO SELECT LOCATION FOR APPLICATION OF BENDING FORCES. CONTROL ALL DNC EQUIPMENT WITH A CNC MASTER UNIT.

MMT PROGRAM PLAN

FUNDING (\$000)

67 88 89 90 91

COMPAND -- AMCOM

(CONTINUED)

(0403) TITLE - PRODUCTION CRITERIA FOR HARDENING (CAD/LAM)

PROBLEM - ESTAB HEAT TREAT PROCEDURES RESULT IN UNNECESSARILY HIGH REJECT RATES, FREQ RE-HEAT TREAT, & TOO MANY COMPONENTS WITH MARGINAL QUALITY. HEAT TREAT PERSONNEL JOINT HAVE COMPREHENSIVE SINGLE SOURCE OF INFO ON REC HEAT TREATS AND QUENCHANT SELECTIONS.

SOLUTION - RELATIONSHIPS OF DIFFERENT VARIABLES SUCH AS QUENCH RATES, COMPONENT SIZE, SHAPE, & COMPOSITION WILL BE ESTAB. COMPUTER DATABASE WILL RESULT IN THE BEST INITIAL CHARGE F/HEAT TREAT. HEAT TRANS SIMULATIONS WILL VERIFY HEAT FLUX IN COMPONENTS.

(0442) TITLE - AUTOMATIC MACHINING OF CMAPY & TENSILE BLANKS

PROBLEM - CANNON TUBE TEST SPECIMEN BLANKS ARE SAVED MANUALLY. THIS METHOD IS TIME CONSUMING AND OFTEN RESULTS IN BLANKS THAT ARE OVERSIZED AND REQUIRE ADDITIONAL MACHINING OPERATIONS.

SOLUTION - ADAPT HIGH SPEED CUTTING PROCEDURES AND AUTOMATED HANDLING TECHNIQUES IN ORDER TO DECREASE MACHINING TIME AND ELIMINATE SUBSEQUENT MACHINING OPERATIONS.

(0509) TITLE - COMPUTERIZED FOUNDRY MELT COMPOSITION CONTRL

PROBLEM - PRESENT METHODS FOR DETERMINING THE MELT CHARGE ARE INEFFICIENT & INCREASE MELT TIME CONSUME EXCESS ELECTRICITY AND ELECTRODES THEREBY INCREASING COSTS.

SOLUTION - INSTALL COMPUTER CONTROLS TO MONITOR THE MELT AND ELECTRIC POWER AND ELECTRODE THE RESULT WILL BE MORE ACCURATE COMPOSITIONS AND POOR TEMPERATURES THE RESULT WILL BE LOWER COST CHARGES & LESS ENERGY AND ELECTRODE CONSUMPTION.

(0510) TITLE - AUTOMATED INSPECTION OF RECUCL COMPONENTS

PROBLEM - PRESENTLY, MANY COMPONENTS ARE UNSALVAGEABLE DUE TO LACK OF STRAIGHTNESS OF THE TUBE, OUT OF ROUND, AND UNACCEPTABLE INTEGRITY OF MACHINED SURFACES. USING IN-PROCESS MANUAL DETECTION METHODS WILL NOT SOLVE THE PROBLEMS BECAUSE THEY ARE TOO SLOW.

SOLUTION - A COMPUTERIZED MEASURING AND RECORDING SYSTEM WILL BE DEVELOPED AND APPLIED TO THE DETERMINATION CYLINDRICITY OF STUCK THROUGHOUT FABRICATION. TECHNOLOGY TO BE INVESTIGATED INCLUDES ULTRASONICS, LASERS, ELECTROMAGNETIC SENSOR, AND GAUGING SENSORS.

73 0 0 0 0

0 0 60 60 100

0 0 0 250 270

167 410 0 0 0

PMT PROGRAM PLAN

FUNDING (\$000)				
87	88	89	90	91
0	330	0	0	0

COMPACT -- APCCOM

(CONTINUED)

(B510) TITLE - THIN FILM COATINGS FOR LASER EYE PROTECTION

PROBLEM - A HIGH-U OPTICAL NOTCH FILTER DESIGN HAS BEEN ESTABLISHED FOR LASER THREAT PROTECTION OF DIRECT VIEW SENSORS AND OPTICS. AN OPTIMIZED PROCESS OF OPTICAL COATINGS FOR THE FILTER HAS NOT BEEN ESTABLISHED.

SOLUTION - AN OPTIMIZED OPTICAL COATING PROCESS FOR THE FILTER REALIZATION WILL BE ESTABLISHED.

(B545) TITLE - GAS SHIELDED METAL POWDER ARC WELDING

PROBLEM - COMMERCIAL WELDING ELECTRODES ARE NOT AVAILABLE IN THE DESIRED CHEMISTRY. SPECIAL ORDERS OF ELECTRODES ENTAIL DELAYS AND ADDED COST.

SOLUTION - USE POWDERED METAL TO FORMULATE THE DESIRED CHEMICAL MIX.

(B546) TITLE - MACHINERY CONDITIONS SURVEILLANCE SYSTEM

PROBLEM - PROVISION DOES NOT PRESENTLY EXIST FOR CONTINUOUS LARGE-SCALE MONITORING OF MACHINE TOOL DYNAMICS IN ORDER TO DETECT CONDITIONS WHICH ARE LIKELY TO RESULT IN MECHANICAL MALFUNCTION.

SOLUTION - INTRODUCE A DYNAMIC UN-LINE SYSTEM FOR MONITORING MACHINE TOOL VIBRATIONS AND OTHER OPERATING PARAMETERS. TRANSDUCERS WILL BE PERMANENTLY INSTALLED ON SELECTED MACHINES AND DATA TRANSFERRED TO A CENTRAL SYSTEM FOR ANALYSIS.

(B552) TITLE - ELECTROPOLISHING TO IMPROVE TUBE FATIGUE LIFE

PROBLEM - STRESS CONCENTRATION AREAS SUFFER FROM AMPLIFIED FATIGUE CRACKING AND ARE THE CAUSE OF EARLY TUBE CORROSION. THE 155MM M105 KEYWAY JOLT AND THE 105MM M68 BREECH THREAD FEATURES ARE EXAMPLES OF EARLY FATIGUE CRACKING.

SOLUTION - THE REDUCTION OR ELIMINATION OF THE STRESSES WILL BE ACCOMPLISHED BY THE USE OF EXTERNAL ANODES CONFIGURED TO MATCH THE AREA TO BE TREATED.

(B553) TITLE - APPL OF REFRACTORY + OTHER COATINGS BY THE SPUTTERING TECH

PROBLEM - COATING LINERS WITH TANTALUM ELECTRODEPOSITION FROM MOLTEN SALTS INVOLVES HEATING THE SUBSTRATE TO ABOUT 800 DEGREE C. AT THIS TEMPERATURE GUN STEEL UNDERGOES UNDESIRABLE CHANGES IN MECHANICAL PROPERTIES.

SOLUTION - HIGH RATE SPUTTERING IS A TECHNIQUE WHICH CAN BE USED TO DEPOSIT METALLIC COATINGS IN REASONABLE TIME INTERVALS AT SUBSTRATE TEMPERATURES AS LOW AS 70 DEGREE C.

MMT PROGRAM PLAN

FUNDING (9000)

87 88 89 90 91

COMPAND -- ANCLON

(CONTINUED)

(19559) TITLE - CIM FOR CANNON, CAE/CAM/CONA

383 712 0 0 0

PROBLEM - THE EXCHANGE OF MANUFACTURING DATA AT WATERVLIET ARSENAL IS LARGELY MANUAL, ERROR PRONE AND TIME CONSUMING. CURRENT PROCESS PLANNING, SCHEDULING, AND PRODUCTION CONTROL SYSTEMS EXCHANGE DATA MANUALLY.

SOLUTION - DETERMINE THE SYSTEM REQUIREMENTS FOR A COMPUTER AIDED DESIGN SYSTEM. DETERMINE THE SYSTEM REQUIREMENTS TO INTEGRATE THE COMPUTER AIDED MANUFACTURING FACILITIES AND BUSINESS SYSTEMS. THE SYSTEM REQUIREMENTS WILL BE ADDRESSING EXISTING AND NEAR TERM.

(19573) TITLE - GENERIC GUN GYMNASTICATOR

0 0 200 200 200

PROBLEM - LIVE FIRINGS ARE CURRENTLY USED TO RESOLVE ACCEPTANCE TESTS AND MALFUNCTION PROBLEMS ASSOCIATED WITH AUTOMATIC CANNONS (20-40MM). CYCLING THESE WEAPONS USING LIVE AMMUNITION IS EXCESSIVELY COSTLY AND TIME CONSUMING.

SOLUTION - FABRICATE A GENERIC GUN GYMNASTICATOR TO CYCLE AUTOMATIC CANNONS MECHANICALLY. THIS WILL ELIMINATE LIVE TEST FIRINGS AND THE ASSOCIATED COSTS (AMMUNITION, FIRING RANGE COSTS, TRANSPORTATION CHARGES, ETC). TESTING TIME WILL BE REDUCED.

(19611) TITLE - AUTOMATED ANALYSIS & CONTROL OF PLATING BATHS

138 0 1.5 0 0

PROBLEM - PERIODIC MET CHEMISTRY ANALYSIS OF PLATING BATHS IS REQUIRED TO MAINTAIN PROPER CHEMICAL BALANCE. THE TIME LAG BETWEEN ANALYSIS AND USE IS A DETRIMENTAL FACTOR.

SOLUTION - APPLY AUTOMATED ANALYTICAL EQUIPMENT FOR THE CONTINUOUS MONITORING OF BATH COMPOSITIONS AND FOR THE AUTOMATIC ADDITION OF THE REQUIRED INGREDIENTS. THIS EQUIPMENT WILL IDENTIFY IMPURITIES IN THE BATH AND ALSO CHECK WASTEWATER.

(19621) TITLE - ADVANCED TUBE MANUFACTURING

0 0 0 0 150

PROBLEM - AT PRESENT, COMMERCIAL PROCESSES FOR FABRICATING PATENTIALS DESIGNED FOR USE AT ELEVATED TEMPERATURES INTO GUN TUBES ARE NOT AVAILABLE OR ARE PROHIBITIVELY EXPENSIVE.

SOLUTION - EVALUATE POWDER METALLURGY, SPRAY FURNING AND VACUUM DOUBLE ELECTRODE REMELTING FOR PRODUCING BILLETS OF GENERAL TOOL STEELS OR NICKEL SUPERALLOYS FOR PLATY FORGING INTO CAL .50 GUN TUBES. DEVELOP THE MOST PROMISING METHOD INTO A PRODUCTION PROCESS.

MMT PROGRAM PLAN

FUNDING (1000)

87 88 89 90 91

COMPANC -- AMCLON

(CONTINUED)

(18625) TITLE - MANUFACTURING OF MULTI-LUG BREECH MECHANISMS

PROBLEM - THE MANUFACTURE OF MULTI-LUG COMPONENTS INVOLVES THE USE OF FORM CUTTERS WHICH ARE USED TO MILL THE REQUIRED CONFIGURATION. ALTHOUGH THIS METHOD HAS BEEN SUCCESSFUL ON A PROTOTYPE BASIS, IT DOES NOT APPEAR TO BE FEASIBLE FOR PRODUCTION QUANTITIES.

SOLUTION - INVESTIGATE ALTERNATIVE METHODS OF MANUFACTURING MULTI-LUG BREECH COMPONENTS, SUCH AS BROOMING AND GRINDING.

(18635) TITLE - PROCESS CONTROL AND INFORMATICS SYSTEM

PROBLEM - SEVEN METAL FINISHING FACILITIES AT WATERVLIET ARSENAL NEED MONITOR AND CONTROL SYSTEMS. SOME OF THESE FACILITIES ARE BEING AUTOMATED UNDER OTHER EFFORTS. MANUAL FUNCTIONS CONTROL 3 OF THE 7 SYSTEMS. A LESS THAN OPTIMUM FINISH OR COATING RESULTS.

SOLUTION - DETERMINE FACTORS RELATING TO CONTROL AND MONITOR OF SURFACE TREATMENT PROCESSES. ESTABLISH REQUIREMENTS FOR AN AUTOMATED PROCESS DATA ACQUISITION SYSTEM, WHICH WILL ESTABLISH AN ELECTRONIC DATA BASE REQUIRED FOR MANAGEMENT DECISIONS.

(18636) TITLE - IMPROVED BARREL INSPECTION TECHNIQUES FOR THE M16

PROBLEM - PRESENT IN-PROCESS INSPECTION TECHNIQUES REPRESENT OUTDATED TECHNOLOGY. THEREFORE PRODUCTION CAPABILITY, QUALITY AND COSTS ARE ADVERSELY AFFECTED. CURRENT PROCESSES UTILIZED IN MFG THE BOLT REQ. IMPROVEMENT COST AND QUALITY.

SOLUTION - AUTOMATED, NON-CONTACT INSP TECH WILL BE USED FOR BARREL MEAS AS IN PROCESS CONTROL. THIS SYSTEM WILL OPTIMIZE PRODUCTION CONTROL THRU AUTOMATED FEEDBACK. PROCESS CHANGES SUCH AS SHOT PEENING TO ROLL FORGING ARE CONTEMPLATED.

(18637) TITLE - SIMULATION + MODELING OF MFG PRODUCTION (NPNS + FIRE CONTROL

PROBLEM - THE TRANSITION OF DESIGNS TO FS PRODUCTION IS PLAGUED BY COST OVERRUNS. CAUSES INCLUDE LACK OF COORDINATION BETWEEN ENGINEERING AND MANUFACTURING, LACK OF TIME TO DEFINE AND EVALUATE A LARGE NUMBER OF MFG ALTERNATIVES, AND OTHER START UP PROBLEMS.

SOLUTION - APPLY A GENERAL PURPOSE SIMULATION SYSTEM TO EVALUATE REPRESENTATIVE MODELS OF MFG SYSTEMS FOR WEAPONS/FIRE CONTROL. USE A GROUP TECHNOLOGY DATA BASE TO DETERMINE MFG REQUIREMENTS AND PRODUCTION FACILITIES.

MMT PROGRAM PLAN

FUNDING (\$000)

67 88 89 90 91

COMPANL -- ANCCOM

(CONTINUED)

(18038) TITLE - CONTRLL OF SEQUENTIAL MACHINING OPERATIONS

PROBLEM - PRESENTLY, IN ALMOST ALL AUTOMATED MACHINING OPERATIONS, CUTTING RATES ARE LOWERED TO AVOID TOOL BREAKAGE AND REJECTION OF COMPONENTS. MACHINING PARAMETERS ARE SET BY ALLOWING FOR WORST POSSIBLE CONDITIONS.

SOLUTION - ESTABLISH AN IN-PROCESS INSPECTION AND CONTROL SYSTEM DIRECTED TOWARD DRILLING, REAMING, TAPPING, BORING, INTERNAL GRINDING, AND HONING. THE AUTOMATED, COMPUTERIZED MACHINING SYSTEM WILL INTEGRATE THESE OPERATIONS.

194 370 0 0 0

(18041) TITLE - MFG OF TITANIUM ALLOY METAL MATRIX CANNON COMPONENTS

PROBLEM - THE INTRODUCTION OF TITANIUM ALLOY + VARIOUS METAL MATRIX FURMS FOR LIGHT WEIGHT REINFORCING JACKETS ON GUN TUBES WILL PRESENT MANUFACTURING PROBLEMS. THE PROBLEMS INCLUDE THE DETERMINATION OF PROPER TOOLING AND METHOD OF MANUFACTURING.

SOLUTION - THIS PROJECT WILL ATTEMPT TO DETERMINE AN EXACT METHOD OF MANUFACTURING COMPONENTS UTILIZING EXOTIC MATERIALS. BY EXPERIENCING THE PERFORMANCE OF VARIOUS CUTTING TOOL MATERIAL, GEOMETRY AND SET PARAMETERS FOR NEW MATERIALS AND COMPONENTS.

100 265 0 0 0

(18042) TITLE - APPLICATION OF ADVANCED MATERIALS TO CANNON PRODUCTION

PROBLEM - EXISTING MANUFACTURING GUIDELINES ARE NOT YET ESTABLISHED FOR MANUFACTURING TITANIUM ALLOY GUN TUBE JACKETS. THE USE OF TITANIUM WILL REQUIRE MATERIAL CHARACTERIZATION. THIN-WALL DESIGN PRESENTS PROBLEMS WITH WELDING, SPRINK FITTING, FORGING.

SOLUTION - THE SOLUTION UTILIZED WILL DEPEND UPON THE EXACT ALLOY USED IN PRODUCTION. THEY WILL INVOLVE VARIOUS TECHNIQUES INCLUDING LASER WELDING, CRYOGENIC SHRINKING. THE SOLUTION WILL ENCOMPASS THE DEVELOPMENT OF MANUFACTURING PROCEDURE AND PROCESS.

200 150 150 0 0

(18718) TITLE - WELD REPAIR AND MAINTENANCE OF M.S.S. TOOLING

PROBLEM - DAMAGED, WORN OR OUTMODED TOOLS ARE DISCARDED BECAUSE OF COSTS OR IMPRACTICALITY OF REGRINDING.

SOLUTION - DEVELOP A GRINDING TECHNOLOGY BY WHICH TOOLS CAN BE REPAIRED, MODIFIED, RECOMMISSIONED AND RETURNED TO SERVICE.

0 0 0 155 00

MNT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPANY -- AMCCOM

(CONTINUED)

(8721) TITLE - OPTIMIZATION OF MANUFACTURING METHODS

PROBLEM - WATERLOO ARSENALS MACHINE TOOL INVENTORY CONSISTS OF STATE-OF-THE-ART EQUIPMENT, BUT ITS CUTTING TOOL INVENTORY IS NOT STATE-OF-THE-ART.

SOLUTION - MAXIMIZE PRODUCTIVITY BY COMPARING THE CAPABILITIES OF OUR NEW MACHINE TOOL WITH THE CURRENT STATE-OF-THE-ART.

(8722) TITLE - IMPROVED HANDLING OF HOT ROTARY FORGED TUBES

PROBLEM - ROTARY FORGED GUN TUBES IMMEDIATELY AFTER FORGING ARE EASILY DISTORTED BY IMPROPER HANDLING OR IMPROPER SUPPORT DURING COOLING.

SOLUTION - THIS PROJECT WILL INVESTIGATE METHODS OF AUTOMATIC HANDLING IMPROVED METHODS OF TUBE SUPPORT DURING COOLING AND METHODS OF CONTROLLED UNIFORM COOLING.

(8731) TITLE - METHOD FOR FABRICATING COMPOSITE GUN TUBES

PROBLEM - THE PRESENT METHOD OF FABRICATING A COMPOSITE TUBE UTILIZES A WIRE LAYOUT TECHNIQUE, WHICH TIME CONSUMING & EXPENSIVE. THIS IS DONE TO IMPROVE THE STRENGTH OF THE EXTENDED TUBE SO AS TO AVOID TUBE DROP & MAINTAIN PROPER POSITIONING WITHIN VEHICLE.

SOLUTION - THE SOLUTION IS TO AUTOMATE THE PROCESS & ELIMINATE THE HUMAN ELEMENT EXCEPT TO MONITOR THE PROCESS. A SYSTEM TO AUTOMATICALLY LAY DOWN THE LUNGOSIN PREDETERMINED POSITION. EITHER A FILAMENT WINDING MACHINE OR BRAIDING MACHINE WITH MODIFICATION.

(8805) TITLE - CHROME RECOVERY FROM PLATING PROCESS

PROBLEM - PRESENTLY THERE ARE NO FACILITIES AVAILABLE TO RECOVER CHROMIC ACID FROM THE CHROME PLATING EFFLUENT. CRITICAL AND EXPENSIVE CHROMIC ACID IS LOST DUE TO OUR INABILITY TO RECYCLE THIS EFFLUENT.

SOLUTION - DESIGN AND FABRICATE PROTOTYPE SYSTEM THAT CAN PROCESS CHROMIUM WASTE DISCHARGE AND RETURN THE CHROMIUM TO THE PROCESSING TANK.

(8815) TITLE - EXPERT KNOWLEDGE DATA BASE FOR WELDING

PROBLEM - A ROBOTIC SYSTEM WILL ALLOW GAS METAL ARC WELDING (GMAW) AT FASTER SPEEDS, HIGHER FEED RATES AND WELDING CURRENTS. EXISTING PROCEDURES FOR MANUAL MANIPULATION DO NOT TAKE ADVANTAGE OF THE ROBOTIC SYSTEMS CAPABILITIES.

SOLUTION - DEVELOP NEW CERTIFIED WELD SCHEDULES ON STD MATERIALS. A COMPUTERIZED EXPERT DATA BASE WILL BE DEVELOPED TO TAKE ADVANTAGE OF HIGHER DEPOSITION RATES, INCREASED DUTY CYCLES, AND COMPUTER CONTROL AVAILABLE WITH THE SYSTEM.

MMT PROGRAM PLAN

FINISHING (10000)

27 AB 69 90 91

COMPAND -- ANCCOM

(CONTINUED)

(08017) TITLE - CONTINUOUS PROCESS FOR FIRE CONTRLL OPTIC GLASS

PROBLEM - CONTINUOUS MELTING OF OPTICAL GLASS IS NOT COST EFFECTIVE FOR LOTS LESS THAN 5000LBS. THE LENS MOLDING TECHNOLOGY HAS NOT BEEN APPLIED TO THE LANTHNUM GLASSES.

SOLUTION - A CONTINUOUS MELTING UNIT WILL BE DESIGNED, CONSTRUCTED AND PROVED OUT. THIS WILL BE USED WITH GLASS LENSE MOLDING TECHNOLOGY TO DEMONSTRATE THE PRODUCTION OF LANTHNUM-GLASS LENSES.

(08023) TITLE - CERAMIC METAL (LEMMET) BARREL PLATING TECHNOLOGY

PROBLEM - THE METHOD OF CHROME PLATING WEAPON BORES HAS HIGH LABOR AND MATERIAL COSTS. CHROME PLATE HAS A CHARACTERISTIC OF CRAZE CRACKING, FLAKING AND DELAMINATION WHICH REDUCES THE LIFE OF WEAPON BARRELS.

SOLUTION - APPLICATION OF CERMET COATINGS WITH FAST RATE ELECTRO DEPOSITION OR RAPID FLOW PLATING WOULD REDUCE PRODUCTION COSTS, DECREASE PRODUCTION CYCLE TIMES AND ENHANCE BARREL PERFORMANCE BY 15-20 PERCENT.

(08099) TITLE - ADVANCED INSPECTION OF THREADS

PROBLEM - THREAD INSPECTION IS ESSENTIALLY MANUAL USING A CONTACT METHOD. RESULTS VARY ACCORDING TO THE INSPECTOR AND THE SELECTED THREAD, AND THE THREAD CONTACT AREA IS NOT KNOWN.

SOLUTION - APPLY AUTOMATED NON-CONTACT METHODS TO INSPECT DIFFERENT TYPES OF THREADS ACCORDING TO FUNCTIONAL REQUIREMENTS OF THE THREADS.

(08917) TITLE - PRECISION GLASS MOLDING

PROBLEM - PRESENT METHODS FOR MOLDING LENSES IS LIMITED IN ITS ABILITY TO PRODUCE PRECISION FINISHED ITEMS FROM THE MOLDS. ADDITIONAL HAND FINISHING OPERATIONS ARE REQUIRED.

SOLUTION - A STATE-OF-THE-ART PROCESS WILL BE DEVELOPED AND REFINED TO PROVIDE A TECHNIQUE THAT WILL PRODUCE A VARIETY OF OPTICAL ELEMENT COUNTOURS. CURRENT PROCEDURES WILL BE REVISED FOR HIGHER PRODUCTION QUANTITIES.

163 120 200 34 0

0 100 58 100 100

0 0 60 400 170

0 0 180 200 250

NMT PROGRAM PLAN

FUNDING (\$000)				
87	88	89	90	91

COMPAND -- AMCCOM

(CONTINUED)

(8918) TITLE - AUTO FIRING TESTING FOR THE M16A2 + M60 GUN BARRELS

PROBLEM - PRESENT TEST FIRING METHODS ARE LARGE INTENSIVE AND OPERATOR DEPENDENT.

SOLUTION - DEVELOP A SYSTEM BASED ON COMPUTER CONTROLLED KNOCKOUT DEVICES TO PERFORM THE TEST FIRINGS, DATA GATHERING AND DATA ANALYSIS.

(8920) TITLE - SYNTHETIC GLASS

PROBLEM - PRESENT METHODS USED FOR MANUFACTURING OPTICAL ELEMENTS REQUIRES HEATING GLASS TO ALLOW IT TO BE FURNED IN MOLDS. THE GLASS MUST THEN BE GROUND AND POLISHED TO FORM THE FINISHED ELEMENT. THIS METHOD IS TIME CONSUMING AND REQUIRES HIGH SKILLS.

SOLUTION - POURABLE SYNTHETIC GLASS WILL UTILIZE A SINGLE STEP OPERATION WHERE THE GLASS IS POURED INTO MOLDS, AT ROOM TEMPERATURE, AND ALLOWED TO CURE.

(8926) TITLE - TOOL/WORKPIECE POSITION ANALYSES

PROBLEM - SCRAP, SLOW MACHINING RATES AND SHORTENED TOOL LIFE ARE CAUSED BY UNDETECTED DRIFTING BETWEEN THE TOOL AND WORKPIECE. DISTURTING FORCES AND WEAR CAUSE SHIFTS IN THE RELATIVE POSITIONS OF WORKPIECE CENTERLINES, INDEXING HEAD, TURNETS, CHUCKS AND TOOLS.

SOLUTION - APPLY REMOTELY LOCATED, INDEXABLE OPTICAL TYPE SENSORS AND MULTIPLES OF INTERCONNECTED FIXED-POSITION SENSORS TO CHECK THE RELATIVE ACCURACIES OF INDEXING HEAD, TURRET, TOOL AND WORKPIECE POSITIONS.

(8927) TITLE - INJECTION MOLDING OF RUBBER SEALS FOR GUN MOUNTS

PROBLEM - RUBBER SEALS FOR GUN MOUNTS ARE CURRENTLY COMPRESSION MOLDED, A RELATIVELY SLOW PROCESS REQUIRING EXTENSIVE MANUAL LABOR. THE RUBBER MUST BE SHAPED INTO A PREFORM AND THE MOLDS MUST BE LEADED BY HAND. COMPRESSION MOLDS ARE VULNERABLE TO BEING DAMAGED.

SOLUTION - MAKE RUBBER SEALS BY INJECTION MOLDING. THIS COULD REDUCE CURE TIME FROM 30 MIN. TO 5 MIN. OR LESS. INJECTION MOLDING ELIMINATES NEED FOR PREFORMS. ALSO, INJECTION MOLDING IS SEMI-AUTOMATIC, NOT REQUIRING PRECISE HANDLING AS IS COMPRESSION MOLDING.

NMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMBAND -- AMCCOM

(CONTINUED)

(9032) TITLE - ADVANCED MATERIAL HANDLING AND DISTRIBUTION

PROBLEM - INCREASING USE OF COMPUTER INTEGRATED MANUFACTURING (CIM) METHODOLOGIES REQUIRE THAT ALL ASPECTS OF COMPONENT TRANSFER BE INTERFALED SUCH THAT KNOWLEDGE OF LOCATION, LOT-SIZE, MATERIAL TYPE, AND MOVE TIMES BE MANAGED AT CENTRAL LOCATIONS.

SOLUTION - INCORPORATE COMPUTER-CONTROLLED MATERIAL HANDLING SYSTEMS, SMART CONVEYERS, RADIO-CONTROLLED FORK TRUCKS, AUTOMATED GUIDED VEHICLES, AND INTELLIGENT STORAGE SYSTEMS TO ENHANCE MATERIAL HANDLING EFFORTS IN CIM.

• C M P A N L •
•-----•
• DESCOM •

(3001) TITLE - POWER + INERTIA SIMULATOR (PAISI) COMBAT VEHICLE TESTING

PROBLEM - THE TEST TRACK AT THE MAINZ ARMY DEPOT IS A PRIMARY BOTTLENECK IN THE REBUILD MISSION. ALTHOUGH THE TEST TRACK IS OVERLOADED AN INCREASE IN THE WORKLOAD IS PROJECTED.

SOLUTION - A POWER AND INERTIA SIMULATOR FOR TESTING COMBAT VEHICLES WILL BE DESIGNED AND FABRICATED.

(3004) TITLE - CLEANING OF MAJOR COMPONENTS

PROBLEM - THOROUGH CLEANING OF HULLS, TURRETS, ENGINES, TRANSMISSIONS IS LABOR INTENSIVE.

SOLUTION - DEVELOP A NOZZLE, HIGH PRESSURE CLEANING SYSTEM WHICH WILL MEET ENVIRONMENTAL REGULATIONS AND REDUCE WATER CONSUMPTION.

(4002) TITLE - RUBBER INJECTION MOLDING OF DOUBLE PIN TRACK

PROBLEM - REBUILD OF TRACK BLOCKS IS CURRENTLY BEING ACCOMPLISHED USING 1940S TECHNOLOGY TO BOND RAW RUBBER TO THE STEEL BASE COMPONENT AND THEN CURING THE TRACK BLOCK BETWEEN STEAM PLATEMS FOR 2 HOURS.

SOLUTION - ESTABLISH AN AUTOMATED (ROBOT) INJECTION MOLDING PROCESS THAT WILL CURE THE RUBBER TRACK PAD ON THE TRACK SHOE IN TEN MINUTES OR LESS.

300 0 0 0 0

0 660 240 300 0

100 200 0 0 0

MNT PROGRAM PLAN

FUNDING (\$,000)

87 88 89 90 91

COMPAND -- DESLOM

(CONTINUED)

(MCOB) TITLE - SMALL ARMS TARGETING (LASER)

0 250 0 0 0

PROBLEM - ACCURACY TESTING OF SMALL CAL WEAPONS REQUIRES THE FIRING OF SEVERAL ROUNDS OF AMMUNITION TO ZERO THE WEAPON ON THE TARGET. THESE ROUNDS CANNOT BE USED TO DETERMINE ACCURACY, THEREFORE ARE EXTRA AS FAR AS THE ORIGINAL INTENT.

SOLUTION - PROVIDE A LASER BASED SYSTEM FOR INITIAL ALIGNMENT OF THE WEAPON/SIGHTS. THIS SYSTEM WILL UTILIZE AVAILABLE TECHNOLOGY AND WILL ELIMINATE THE NEED TO FIRE LIVE ROUNDS FOR ZEROING.

C L M A M L

TACOM

(4035) TITLE - LASER PROCESSING OF STEEL COMPONENTS FOR M1

125 170 0 0 0

PROBLEM - CONVENTIONAL AND INDUCTION HEAT TREATMENT OF STEEL COMPONENTS SUCH AS THE DRIVE SPROCKET, TURRET RACE RING AND MAIN RING GEAR CAN RESULT IN PART DISTORTION AND DIMINISHED PHYSICAL PROPERTIES.

SOLUTION - PROVIDE A PRECISION INSTRUMENT TO PERFORM HARDENING OPERATIONS. A LASER IN LIEU OF PRESENT HEAT TREAT METHODS WILL REDUCE DISTORTION AND IMPROVE THE QUALITY OF HEAT TREATED COMPONENTS.

(4073) TITLE - REPL OF ELECTRON BEAM WELD BY LASER WELD F/AGT-1500 COMP

150 939 900 400 200

PROBLEM - AGT-1500 ENGINE COMPONENTS ARE CURRENTLY EB WELDED WHICH IS SLOW AND COSTLY.

SOLUTION - REPLACE EB WELDING WITH LASER WELDING WHICH WILL SAVE SUBSTANTIALLY IN TIME & THUS RESULT IN SAVINGS.

(4092) TITLE - ROBOTIC WELDING FOR M113 WEQUILU

0 550 200 0 0

PROBLEM - PREVIOUS EFFORT TO IMPLEMENT ROBOTIC WELDING AT ARAD HAS FAILED. EQUIPMENT NOW SITS IDLE ON SHOP FLOOR.

SOLUTION - ADD SEAM TRACKING AND ADAPTIVE CONTROL CAPABILITY, IN LABORATORY ENVIRONMENT. AT TACOM, THE RE-INSTALL AT ARAD AND IMPLEMENT.

MNT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMB-MU -- TACLM

(CONTINUED)

(4093) TITLE - DAY ICE BLAST FOR PAINT REMOVAL

PROBLEM - CURRENT SAND BLAST METHOD OF PAINT REMOVAL FOR GEPOT REBUILD OPERATIONS IS SLOW, REQUIRES SAND RECOVERY EQUIPMENT AND IS WORKER HAZARDOUS DUE TO DUST INHALATION OR SILICOSIS.

SOLUTION - A SYSTEM IS BEING DEVELOPED THAT COMPRESSES AIR TO FORM DRY ICE GRAULES THAT ARE USED AS THE ABRASIVE MEDIUM, THEN SUBLIMATE BACK INTO THE ATMOSPHERE. ADVANTAGES ARE SPEED, NO ABRASIVES TO RECOVER, AND REDUCED WORKER HAZARD.

(4094) TITLE - PLASMA-MIG WELDING FOR ALUMINUM ARMOR

PROBLEM - PLASMA-MIG IS A RELATIVELY NEW WELDING TECHNIQUE THAT IS POTENTIALLY FASTER, WITH CLEANER, HIGHER QUALITY WELDS. THE PROCESS HAS NOT BEEN ADEQUATELY EVALUATED FOR ALUMINUM VEHICLE MANUFACTURE AND REBUILD.

SOLUTION - EVALUATE THE PLASMA-MIG PROCESS FOR ALUMINUM ARMOR WELDING APPLICATIONS.

(4095) TITLE - WEAVE-TYPE WELDING FOR STEEL ARMOR

PROBLEM - PRESENT WELD PROCEDURES FOR STEEL ARMOR WELDING RELY UPON STRINGER TYPE MULTIPLE-PASS WELDS, WHICH ARE SLOW AND NOT AMENDABLE TO AUTOMATION.

SOLUTION - DEVELOP AND EVALUATE A WEAVE TYPE WELDING TECHNIQUE.

(5005) TITLE - COLD FORGED GEARS TO DRAWING TOLERANCES

PROBLEM - MACHINING AND OTHER PROCESSES ADD COST TO THE FINISHED SPUR OR HELICAL GEAR.

SOLUTION - ESTAB A MFG PROCESS TO RESULT IN FINISHED SPUR OR HELICAL GEAR TO DRAWING TOLERANCES FROM BAR STOCK AT AMBIENT TEMPS. MECHANICAL PROPERTY IMPROVEMENTS CAN BE REALIZED BY COLD FORGING GEARS INSTEAD OF MACHINING.

(6057) TITLE - M-1 COMBAT VEHICLE-MFG TECHNOLOGY

PROBLEM - MATERIALS AND MANUFACTURING PROCESSES EMPLOYED IN THE MFG OF THE M1 CAN BE IMPROVED BY INCORPORATING NEW TECHNOLOGIES TO THE CURRENT SYSTEM. THIS WILL ENABLE THE M1 TO BE PRODUCED MORE ECONOMICALLY.

SOLUTION - IMPROVE PROCESSES FOR M1 MFG. THESE INCLUDE THERMAL CUTTING, AUTOMATED METALLIZING, MECHANICAL CUTTING, LASER CUTTING AND MACHINE SYSTEM DIAGNOSTICS.

0 300 100 0 0

0 200 100 0 0

0 300 100 0 0

1000 0 0 0 0

575 390 0 0 0

HMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPANY -- TACOM

(CONTINUED)

(6107) TITLE - APPL OF HAUFELD STEELS TO M1 M67 TRACK SUSPENSION COMPONENT

PROBLEM - INCREASED VEHICLE PERFORMANCE REQUIREMENTS NECESSITATE HIGHER PERFORMANCE TRACKS THAN THOSE AVAILABLE TODAY. TO IMPLEMENT NEW METAL COMPOSITE, HIGHER STRENGTH FERRUS ALLOYS, AND TITANIUM NEW MANUFACTURING PROCESSES MUST BE ESTABLISHED.

SOLUTION - TO IMPLEMENT NEW MATERIAL TRACK SHOES AND PINS, INVESTMENT CASTING AND HOT MOLDING TECHNIQUES WILL BE ESTABLISHED FOR METAL MATRIX COMPOSITES.

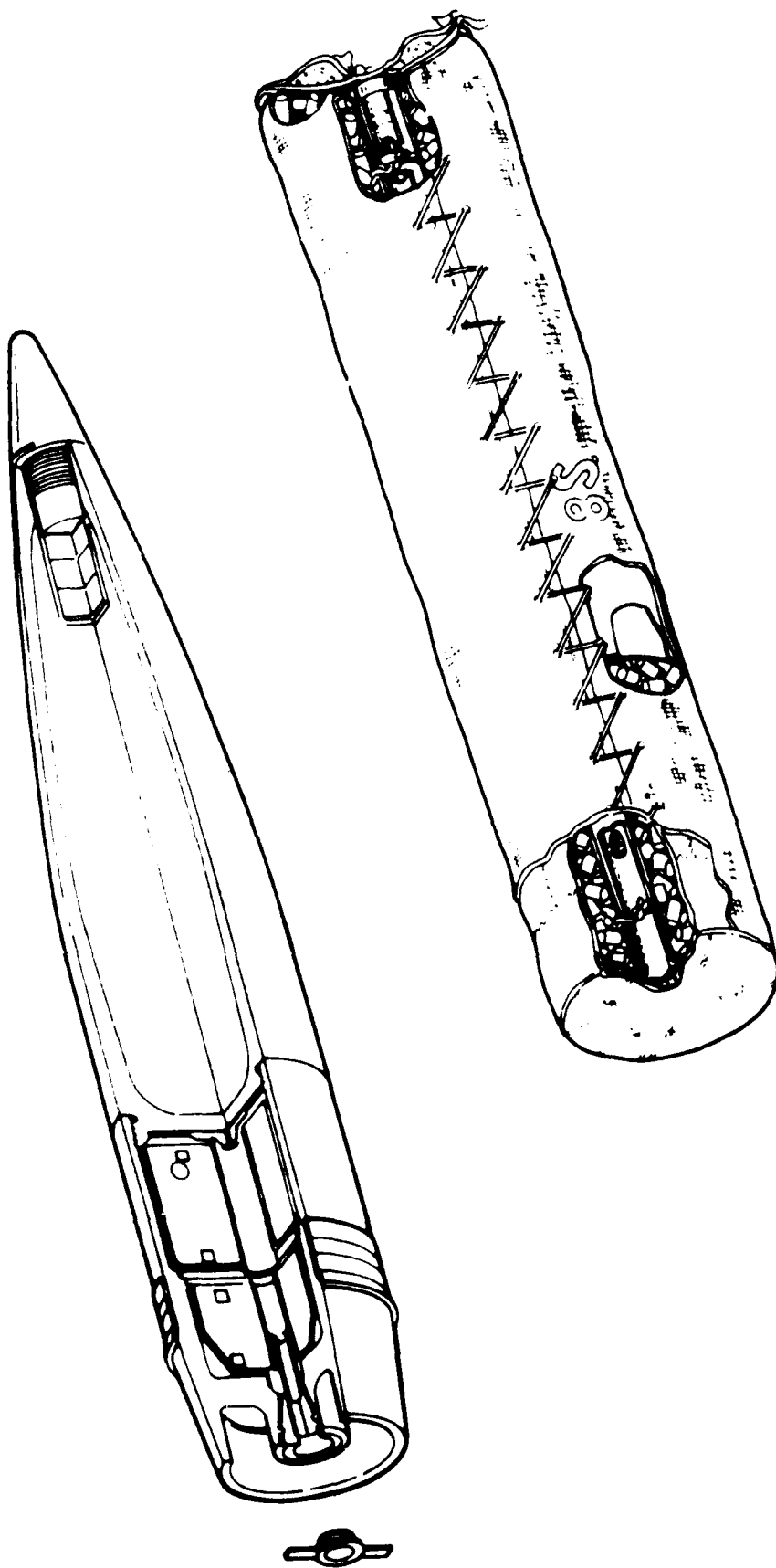
(6125) TITLE - VELD PROCESS PLANNING AND CONTROL

PROBLEM - PLANNING, MONITORING, AND INSPECTION OF THE WELDING PROCESS ARE EXPENSIVE, TIME CONSUMING, AND CAUSE PRODUCTION DELAYS WHEN A QUALITY PROBLEM IS SUSPECTED.

SOLUTION - USE OF COMPUTER BASED PARAMETRIC AND ELECTRO OPTIC.

150 146 0 0 0

105 0 0 0 0



DE 63
AMMUNITION

DE63

COMMAND FUNDING SUMMARY
(THOUSANDS)

COMMAND	FY87	FY88	FY89	FY90	FY91
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AMCCUM	10798	10089	9478	9496	10339
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TOTAL	10798	10089	9478	9496	10339

MMT PROGRAM PLAN

 C O M M A N D

 A M C C M

FUNDING (\$JOU)

87 88 89 90 91

(1805) TITLE - IMPROVED PRODUCTION VIBRATION TESTS-M734 (PIP) FLZE

PROBLEM - PROJECT WILL EXPAND THE CAPABILITY OF A 3-D VIBRATION SYSTEM BUILT UNDER MMT PROJECTS 79, 80, 81 3961. TEST DEFICIENCIES WILL BE ELIMINATED BY EXACT DUPLICATION OF FLZE TRI-AXIAL WAVEFORMS.

SOLUTION - ADDITIONAL MEMORY, PERIPHERALS, AND SOFTWARE WILL BE ADDED TO STORE LONG DURATION VIBRATION RECORDS AND ANALYZE RAW DATA. VIBRATION RECORDS (RECORDED ACCELERATIONS) ARE AVAILABLE FROM EXISTING TACTICAL DATA BANKS (TECM).

(1808) TITLE - ADVANCED OPTICAL MICROELECTRONICS INSPECTION SYSTEM

PROBLEM - THE MFG OF THICK FILM MICROELECTRONIC ASSEMBLIES IS ACCOMPLISHED BY A SERIES OF COMPLEX TASKS. THESE TASKS ARE TEDIOUS AND TIME CONSUMING PROCESSES, OFTEN LEADING TO HUMAN ERROR. FOR LARGE PRODUCTION LOTS INSPECTION SAMPLING TECHNIQUES ARE USED.

SOLUTION - THE PROBLEM WAS PARTIALLY SOLVED BY A PREVIOUS MMT EFFORT (SR41002). OF THE 25 PRIMARY DEFECTS ISOLATED, 12 WERE AUTOMATED. THE PROPOSED EFFORT WILL USE ADV OPTICAL IMAGING TECH + ACQUISITION TECHNIQUES TO AUTOMATE THE REMAINING 13 DEFECTS.

(4074) TITLE - UPGRADE SAFETY READINESS + PRODUCTIVITY OF EXIST MOLT POUR

PROBLEM - MOLT POUR LINE VETTERATION DUE TO LACK OF FUNDING HAS CREATED NEED FOR DEVELOPING A MODEL PROCESS DESIGN. DESIGN WILL IMPROVE SAFETY, REDUCE EXPLOSIVE QUANTITIES, REMOVE PERSONNEL FROM HAZARDOUS AREAS, INCREASE EFFICIENCY AND REDUCE PRODUCTION COSTS.

SOLUTION - LINE 3A AT IOWA AWP WILL IMPLEMENT CHARACTERISTICS OF MOLT POUR LINES DEVELOPED UNDER PRIOR EFFORTS. THE EQUIPMENT PROCESS CONTROLS AND TECHNOLOGY DEVELOPED WILL PROVIDE A BASIS FOR MODERNIZATION OF OTHER MOLT POUR LINES.

(4164) TITLE - ANAL OF VIBRATION SIGNATURE F/PREDICTING MFG TOOL FAILURE

PROBLEM - THE ABILITY TO PREDICT FAILURE OF MACHINE OR COMPONENTS IS NON-EXISTANT. FAILURES ARE COSTLY AND REDUCE PRODUCTION OUTPUT.

SOLUTION - FREQUENCY ANALYSIS WILL IDENTIFY MACHINE PARTS WHICH ARE DEFECTIVE, UNREPLACED, OR NOT OPERATING PROPERLY.

-120 0 0 0 0

0 1300 0 0 0

928 0 0 0 0

0 0 0 0 230

MMT PROGRAM PLAN

FUNDING (8000)

87 88 89 90 91

COMPARC -- ANCCOM

(CONTINUED)

(4368) TITLE - DEVELOP MSS DETONATOR SEALING EQUIPMENT

PROBLEM - CURRENTLY MSS DETONATORS ARE LACQUERED, PACKED, TEMPORARILY TRANSFERRED, UNIMPACTED, LACQUERED, DRIED AND REPACKED. THIS HANDLING IS CAUSED BY HIGH PRODUCTION RATES, SPACE LIMITATIONS AND SOLVENTS.

SOLUTION - DEVELOP UN-LINE AUTOMATIC SEALING EQUIP APPLICABLE TO SINGLE TOOL DETONATOR LEADERS WHICH WILL ELIMINATE LABOR-INTENSIVE LACQUER SEAL PROCESS. THE HOT-MELT TECHNIQUE WITH INFRARED HEAT LAMP HAS BEEN USED SUCCESSFULLY TO REDUCE MAN POWER.

0 0 0 0 489 0

(4427) TITLE - EVALUATE UN-LINE CHEMICAL ANALYZERS F/NITROGUANIDINE PLANT

PROBLEM - MANY COMPLEX CHEMICAL REACTIONS TAKE PLACE IN THE MFG OF NO. MORE RAPID AVAILABILITY OF CPL ANAL DATA IS NECESSARY TO MINIMIZE THE OCCURRENCE OF UNDESIRABLE STREAM COMPOSITIONS WHICH WOULD REDUCE YIELDS ON CAUSE PROCESS UPSE

SOLUTION - SELECT, PURCHASE, INSTALL AND EVALUATE UN-LINE STATE OF THE ART ANALYTICAL INSTRUMENTATION IN THE MU EQUIPMENT TO BE OPERATED DURING FY87-89.

0 0 511 654 0

(4449) TITLE - PROCESS IMPROVEMENT FOR COMP C-4 + PRX EXPLOSIVES

PROBLEM - THE EXISTING FACILITIES WHICH ARE COMMON TO THE MANUFACTURE OF COMPOSITION C-4 AND THE OTHER PRX COMPOSITIONS LIMIT THE AVAILABILITY OF THESE ITEMS BELOW THEIR MIB REQUIREMENTS.

SOLUTION - ESTABLISH NEW PROCESSES AND METHODS FOR THE MANUFACTURE OF THESE ITEMS TO MINIMIZE THE IMPACT OF COMMON OPERATIONS ON CAPACITY.

0 0 0 234 0 0

(4473) TITLE - AUTOMATED LEAK DETECTION OF WP MUNITIONS

PROBLEM - THE CURRENT METHOD OF HEATING THE WHITE PHOSPHORUS MUNITIONS TO CHECK FOR LEAKS IS LABOR INTENSIVE AND IS NOT UNIFORM FOR ALL ROUNDS.

SOLUTION - PROVIDE A PROTOTYPE AUTOMATED IN-LINE LEAK DETECTION SYSTEM BASED ON QUANTITATIVE FLAME PHOTOMETRY. THE SYSTEM WILL CONSIST OF TWO HEATING STAGES, A SAMPLING WHEEL, LEAK DETECTOR AND HANDLING SYSTEM.

255 0 0 0 0 0

MMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPANE -- ANCLON

(CONTINUED)

(4520) TITLE - PRESS LOADING MIX COMPOSITIONS INTO TANK ROUNDS

PROBLEM - CURRENTLY NO FACILITIES AND ONLY LIMITED TECHNOLOGY EXIST FOR PRESS LOADING LX-14 EXPLOSIVE IN TANK FIRED SHAPED CHARGE PROJECTILES.

SOLUTION - PROCESS PARAMETERS, PROCEDURES AND EQUIPMENT WILL BE DEVELOPED FOR PRESS LOADING LX-14 EXPLOSIVE INTO THE 120MM MPAT-T, XM908 PROJECTILE. WAREAC PARAMETERS WILL BE REFINED TO ENHANCE PRODUCTION BY OPTIMIZING PRESSING TEMP, PRESS, AND Dwell TIMES.

(4531) TITLE - AUTO PROD OF MULTI BASE STICK PROPELLANT LN CAMBL

PROBLEM - VARIOUS STICK MULTI-BASE PROPELLANTS ARE BEING DEVELOPED. BATCH FACILITIES FOR MULTI-BASE HAVE A CONSTRAINED CAPACITY. A NEW CAMBL IS BEING BUILT BUT HAS NOT PROVEN CAPABLE OF MANUFACTURING STICK PROPELLANTS.

SOLUTION - ADAPT RECENTLY DEVELOPED CAMBL PROCESS TO DEMONSTRATE THE MASS PRODUCEABILITY OF THE NEW PROPELLANTS. THIS WILL INSURE A PRODUCTION BASE FOR STICK PROPELLANT AND PREVENT HAVING TO USE AND/OR BUILD INEFFICIENT BATCH FACILITIES.

(4539) TITLE - AUTOMATED CARTRIDGE CASE HARDNESS MEASUREMENT + CONTROL

PROBLEM - MANUAL MEASUREMENTS BY SAMPLING METHODS ARE LABOR INTENSIVE, COSTLY AND SUBJECTIVE TO OPERATOR ERROR.

SOLUTION - DIRECT EDDY CURRENT TECHNIQUE WOULD PROVIDE RELIABLE, COST EFFECTIVE AND AN AUTOMATED METHOD TO MEASURE SIDEWALL HARDNESS GRADIENT.

(4545) TITLE - DIGITAL IMAGE AMPLIFICATION X-RAY SYSTEM (DIAX)

PROBLEM - EXISTING IMAGE AMPLIFICATION X-RAY DOES NOT MEET THE IMAGE QUALITY CRITERIA TO BE USED AS AN INSPECTION TOOL FOR HE MORTAR ROUNDS. FILM RADIOGRAPHY, AS CURRENTLY USED, IS LABOR INTENSIVE, TIME CONSUMING, AND SUBJECT TO HUMAN INTERPRETIVE JUDGEMENT.

SOLUTION - REPLACE WITH AN IMPROVED REAL-TIME IMAGE AMPLIFICATION SYSTEM. TECHNIQUES FOR DIGITAL IMAGE ENHANCEMENT AND ANALYSIS DEVELOPED UNDER THE AXIS PROJECT WILL BE ADOPTED.

MAT PROGRAM PLAN

FUNDING (\$000)

67 84 89 90 91

COMPAND -- AMCCM

(CONTINUED)

- (4578) TITLE - MODIFICATION + IMPROVEMENT OF DMSO PILLET PROCESS FOR RDX/HMX
- PROBLEM - A PILOT SCALE PROCESS FOR RECRYSTALLIZATION OF RDX/HMX USING DMSO WAS DESIGNED, PROCURED AND INSTALLED AT HSAAP. INSUFFICIENT DATA WAS OBTAINED TO YIELD OPTIMIZED OPERATING CONDITIONS.
- SOLUTION - CORRECT MECHANICAL DEFICIENCIES IN EQUIPMENT AND EVALUATE AND OPTIMIZE THE PROCESS. PREPARE A TECHNICAL DATA PACKAGE FOR A FULL SCALE PROCESS BASELINE DOCUMENT.
- (4624) TITLE - AUTOMATED MANUFACTURE OF MILLIMETER WAVE DIODES
- PROBLEM - CURRENT MANUFACTURE OF GUNN, VARACTOR + MIXER DIODES IS SLOW, HAND LABORED BY HIGH PAID SCIENTISTS. THESE GAAS DEVICES OPERATE AT 35 GHZ. THE FABRICATION YIELD IS VERY LOW.
- SOLUTION - TWO VENDORS WILL BE FUNDED TO AUTOMATE THE MANUFACTURING, PACKAGING, AND RF TESTING FOR THE GUNN, MIXER AND VARACTOR DIODES.
- (4625) TITLE - AUTOMATED TESTING OF SILICON IF AMPLIFIER IC
- PROBLEM - COMMERCIAL MONOLITHIC IF AMPLIFIER ICs ARE DEFICIENT IN BAND PASS (1-50 MHZ), NOISE FIGURE (1.5 DB) AND POWER GAIN (60 DB). K&D DEVELOPED A SILICON MONOLITHIC IF AMPLIFIER BUT VOLUME MFG PROCESSES WERE NOT ESTABLISHED.
- SOLUTION - AUTOMATE EPITAXIAL SILICON GROWTH, WAFER FAB, DIFFUSION PROCESSES, PACKAGE FAB, + IC LEVEL RF TESTING, ENVIRONMENTAL TEST + SYSTEM LEVEL TEST. ALSO, AUTOMATE ATTACHMENT OF IC PACKAGE TO MICROSTRIP.
- (4626) TITLE - AUTOMATED ASSEMBLY OF THE MILLIMETER WAVE TRANSDUCER
- PROBLEM - PLACEMENT AND BONDING OF MICROCIRCUITS ONTO MICROSTRIP WAVEGUIDES REQUIRES ACCURACY NOT FOUND IN TODAY'S PICK-AND-PLACE ROBOTS.
- SOLUTION - MODIFY PICK-AND-PLACE ROBOTS, REFINISH SOLDERING AND LASER BONDING EQUIPMENT TO HANDLE FINE BEAM AND BALL-BONDED CHIPS. COMPONENT AND MODULE TEST APPARATUS FOR HIGH FREQUENCY TESTING WILL BE INCORPORATED.
- (4628) TITLE - AUTO MANUFACTURE OF IN DETECTORS AND REFLECTORS
- PROBLEM - CURRENT TEST AND ASSEMBLY PROCESSES ARE NOT CAPABLE OF THE REQUIRED HIGH PRODUCTION RATE AND LARGE VOLUME.
- SOLUTION - REFLECTOR SURFACE MACHINING WILL BE COMPUTER CONTROLLED AND THE TEST AND ASSEMBLY OF IR DETECTOR/REFLECTOR MODULES WILL BE AUTOMATED.

MHT PROGRAM PLAN

FUNDING (\$000)

87	88	89	90	91
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COMPAG -- AMCLON

(CONTIPLD)

(4629) TITLE - AUTO ASSEMBLY + TEST OF IR TRANSDUCER

0	1393	1294	0	0
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PROBLEM - ASSEMBLY AND TEST OF THE IR TRANSDUCER ARE LABOR INTENSIVE OPERATIONS. MANY IN-PROCESS ALIGNMENT AND TEST OPERATIONS ARE DONE MANUALLY BY HIGHLY TRAINED PERSONNEL IN A CLEAN ROOM ENVIRONMENT. THESE MANUFACTURING TECHNIQUES ARE ERROR PRONE.

SOLUTION - THE REQUIREMENTS WILL BE DETERMINED FOR AN AUTOMATED COMPUTER CONTROLLED ALIGNMENT AND TESTING EQUIPMENT. PROCEDURES WILL BE ESTABLISHED FOR PROCESSING IR TRANSDUCERS WITH THIS AUTOMATED EQUIPMENT.

(4630) TITLE - AUTOMATED METHOD OF BURESIGHTING IR

0	0	0	0	1346
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PROBLEM - BURESIGHTING THE TRIAD OF MMW SENSOR, IN SENSOR AND WARHEAD TO LESS THAN 1 MRAO IS LABOR INTENSIVE.

SOLUTION - IMPLEMENTATION OF AN AUTOMATED TEST STATION TO CHECK BURESIGHT/SENSOR ALIGNMENT AND TO MAKE FINAL ADJUSTMENTS AUTOMATICALLY.

(4631) TITLE - AUTO TEST OF SIGNAL PROCESSOR ASSEMBLIES

0	0	0	761	491
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PROBLEM - MICROCOMPUTER SIGNAL PROCESSORS USED IN MILLIMETER-WAVE/IR SENSORS ARE PRESENTLY TESTED WITH INADEQUATE DIAGNOSTIC FAULT FINDING EQUIPMENT AND IN-CIRCUIT ANALYZERS. TESTERS ARE TOO LABOR INTENSIVE FOR UNIT LOAD, CONNECT, DISCONNECT AND UNLOAD.

SOLUTION - COMMERCIALY AVAILABLE TEST EQUIPMENT WILL BE MODIFIED WITH SPECIALLY DESIGNED ADAPTERS AND PROBING HARDWARE. SOFTWARE TESTING AND DIAGNOSTIC ROUTINES WILL BE DEVELOPED TO MINIMIZE DIAGNOSTICS AND REWORK.

(4634) TITLE - AUTO ASSEMBLY OF ELEC MODULE AND TOP SENSOR

0	0	0	912	702
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PROBLEM - SACRAM ELECTRONICS MODULE AND TOP SENSOR ARE LABOR INTENSIVE ASSEMBLIES. PROBLEM AREAS INCLUDE- MINIMAL CLEARANCES, CRUMBED CIRCUIT CARDS, SHORT UNSUPPLIED SPANS, FIXTURING AND FEEDING COMPONENTS FOR PICK AND PLACE.

SOLUTION - AUTOMATED ASSEMBLY PROCESSES WILL BE DEVELOPED WHICH INCLUDE ROBOTS WITH OPTICAL AND TACTILE SENSING FEEDBACK CONTROL SYSTEMS. SMART CONVEYORS, AN AUTOMATED LASER SOLDERING SYSTEM, + INDEXING + POSITION FIXTURES WILL ASSIST IN SYSTEM AUTOMATION.

MMT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPANY -- ANGLON

(CONTINUED)

400 1826 300 0 0

(4637) TITLE - AUTOMATED MANUFACTURE • INSPECTION OF SFF WARHEAD LINERS

PROBLEM - CONVENTIONAL SFF LINER MACHINING AND INSPECTION TECHNIQUES REQUIRED TO ACHIEVE DESIGN TOLERANCES ARE COSTLY AND TIME CONSUMING.

SOLUTION - DEVELOP METHODS TO MANUFACTURE AND INSPECT DUCTILE IRON SFF WARHEAD LINERS IN A PRECISE, LOW COST, HIGH VOLUME MODE.

(4638) TITLE - PRESS LOADING PROCESS FOR EXPLOSIVE FORMED PENETRATORS

PROBLEM - NO PROCESS IS AVAILABLE AT THIS TIME FOR MASS PRODUCTION PRESS LOADING LA-14 EXPLOSIVE INTO THE STAFF MUNITION.

SOLUTION - CONTRACTOR SHALL DEVELOP AND PROCURE A PRECISION EXPLOSIVE WEIGH SCALE AND AUTOMATED PRECISION PRESS LOADING UNIT AND A THREE-COORDINATE CML MEASURING DEVICE TO DEFINE PROCESS PARAMETERS AND PROCEDURES FOR SEMI-AUTOMATED MASS PROD. PRESS LOADING.

(4645) TITLE - AUTOMATED CUP INSPECTION

PROBLEM - THE CURRENT INSPECTION TECHNIQUES ARE LABOR INTENSIVE AND DO NOT ALWAYS CHECK ALL CRITICAL PARAMETERS. TOOL BREAKAGE AND HIGH SCRAP RATES CAN RESULT FROM OUT-OF-SPEC CARTRIDGE CUPS.

SOLUTION - A 30 PPM AUTOMATED FILL AND FORGET INSPECTION MACHINE WILL BE DESIGNED TO MEASURE DIMENSIONS AND RELATIVE HARDNESS. THE MACHINE WILL BE CAPABLE OF INSPECTION AND DATA ANALYSIS FOR UP TO 10,000 PIECES IN 8 HOURS.

(4656) TITLE - NITRAMINE PROPELLANT PROCESSING

PROBLEM - TRIPLE BASE PROP ARE BEING SUPERSEDED BY NEW CLASS OF INSENS LOW VULNERABILITY AMMUNITION BASED ON NITRAMINE(ROX). PRESENT TECH INVOLVE BATCH PROCESSING OF PROPS WHICH IS INEFFICIENT, LABOR INTENS, • INVOLVES HIGH DEGREE OF EXPOSURE TO HAZARDS.

SOLUTION - AUTO CONTINUOUS MIXERS, PROCESSORS, EXTRUDERS, CUTTERS, DRYERS • GLAZERS HAVE BEEN DEVELOPED WHICH, WHEN PROPERLY ADAPTED AND APPLIED, CAN BE USED FOR PROCESSING PROPELLANTS IN A CONTINUOUS, SAFE & EFFICIENT MANNER.

459 267 0 0 0

891 0 655 0 0

MNT PROGRAM PLAN

FUNDING (\$000)

67 80 89 90 91

COMPAL -- APCOM

(CONTINUED)

(4660) TITLE - AUTOMATIC BLENDING OF STICK PROPELLANT

PROBLEM - MANUAL BLENDING OF STICK PROPELLANT IS LABOR INTENSIVE AND AUTOMATIC SYSTEM IS REQUIRED.

SOLUTION - ALTERNATIVE CONCEPTUAL PROCEDURES AND DESIGNS WILL BE DEVELOPED. FINALLY EQUIPMENT TO BLEND 50,000 POUNDS PER MONTH WILL BE IDENTIFIED, DESIGNED, PROCURED, INSTALLED AND EVALUATED. EVALUATION OF PILOT LOT WILL BE CONDUCTED.

1305 375 0 0 0

(4666) TITLE - PROTOTYPE SPIRAL WRAP PROCESS 155MM COMBUSTIBLE CASE LUMPON

PROBLEM - CURRENTLY COMBUSTIBLE CASE COMPONENTS, 155MM M203A1 AND M215/216 CASE BOLLIES, ARE MANUF VIA PULP MOLDING PROCESS, REQUIRING LARGE CAPITAL AND INTENSE LABOR. TO LOWER END ITEM + CAPITAL EQUIP INVEST COSTS, A PROCESS ORIENTED TO MASS PRODUCE MUST BE DEVELOPED.

330 0 0 0 0

SOLUTION - DEVELOP A PROTOTYPE SPIRAL WRAP MANUFACTURING PROCESS SUITABLE FOR MASS PRODUCING 155MM M203A1 AND M215/216 COMBUSTIBLE CASE BOLLIES.

(4693) TITLE - REMOTE AUTOMATIC SAMPLING OF NITROGLYCERIN (NG)

PROBLEM - PRESENT METHOD OF SAMPLING USES AN EDUCATION PROCESS IN WHICH THE SAMPLE IS WASHED AND THEREFORE NOT REPRESENTATIVE. AVAILABLE RIAZZI SAMPLER IS NOT EFFECTIVE AT PRESSURES UP TO 60 PSI WHICH OCCUR IN THE RAREFIED AAP NG TRANSFER SYSTEM.

362 176 0 0 0

SOLUTION - INSTALL AND EVALUATE SAMPLING SYSTEMS ON A BENCH SCALE USING INERT MATERIALS AND DEMONSTRATE SELECTED SYSTEM.

(4768) TITLE - SINGLE BASE STICK PROCESSING

PROBLEM - DEVELOP STICK PROPELLANT MEETING LOADING SPECIFICATIONS

SOLUTION - DEFINE THE PROCESS USING BATCH LINES, PROCURE, INSTALL AND DELEG PROTOTYPE PRODUCTION-SIZED EQUIPMENT AND TEST PROPELLANT PRODUCED.

0 0 0 0 250 1500

(4771) TITLE - IMPROVED OF PROCESS TECHNOLOGY FOR BINARY MUNITIONS

PROBLEM - IN THE CURRENT PRODUCTION OF METHYLPHOSPHONIC DIFLUORIDE, THERE IS PRODUCT LOST DURING PURIFICATION AND DISTILLATION.

0 388 0 0 0

SOLUTION - THE EFFICIENCY OF THE PRODUCTION PROCESS WILL BE IMPROVED BY MODIFYING THE REACTOR AND DISTILLATION PRESSURES, USE ALTERNATE PACKING MATERIALS, AND VARYING REFLUX RATIOS DURING DISTILLATION.

MHT PROGRAM PLAN

FUNDING (\$JOU)

67 88 89 90 91

COMPAN -- ANCLON

(CONTINUED)

(4780) TITLE - SPRAY DRYING OF EXPLOSIVE COMPOSITIONS

PROBLEM - PLASTIC BLENDED EXPLOSIVES AND OTHER COMPOSITIONS ARE CURRENTLY DRIED WITH INEFFICIENT AND LABOR INTENSIVE OED DRYERS.

SOLUTION - A CENTRIFUGAL SPRAY DRYING TECHNIQUE WILL BE DEVELOPED FOR PLASTIC BLENDED EXPLOSIVES AND OTHER COMPOSITIONS.

(4781) TITLE - AUTOMATIC GAGE FOR THREAD INSPECTION

PROBLEM - EXISTING INSPECTION PROCEDURES FOR MEASURING THREAD DIAMETERS AND OTHER THREAD CHARACTERISTICS IS TIME CONSUMING AND EXPENSIVE. IT IS DONE MANUALLY BY MANY TYPES OF CUSTOM GAGES. THE GAGES WEAR OUT AND REQUIRE FREQUENT REPLACEMENT.

SOLUTION - SOLICIT INDUSTRY BY MEANS OF A QUALITATIVE REQUIREMENT INFORMATION (QRI) PRESENTATION. QRI WILL REVIEW EXISTING TECH. FOR THREAD INSPECTION METHODS & SELECT THE MOST SUITABLE TECH. SELECTED TECH. WILL PROVIDE A FULLY AUTOMATIC, PROGRAMMABLE THREAD INSPECTION SYS.

(4782) TITLE - HIGH BULK DENSITY NITROGUANIDINE PROCESS

PROBLEM - HIGH BULK DENSITY NG IS NEEDED BY THE AIR FORCE AS A COMPONENT IN INSENSITIVE HIGH EXPLOSIVE FORMULATIONS FOR UCMBS. THERE IS NO CURRENT CAPABILITY FOR PRODUCING THE PROJECTED AIR FORCE REQUIREMENTS FOR HIGH BULK DENSITY NG (HBDNG).

SOLUTION - ESTABLISH A PILOT PLANT TO DEVELOP A PROCESS FOR THE PRODUCTION OF HBDNG BASED ON STATE OF THE ART TECHNOLOGY AND OBTAIN DATA FOR SCALE-UP OF THE PROCESS TO PRODUCE HBDNG REQUIREMENTS.

(4788) TITLE - AUTOMATED MELT POUR EQUIPMENT F/MEDIUM SIZE PROJECTILES

PROBLEM - MELT POUR LADING WITH GRAVITY FLOW INTO 120MM MORTAR PROJECTILES CAN RESULT IN POOR CAST QUALITY DUE TO LACK OF CONTROL OVER FLOW RATE TO ACHIEVE QUANTITY UNITS ARE OVER FILLED RESULTING IN EXCESSIVE SCRAP AND HIGH LABOR COSTS.

SOLUTION - INSTALL INJECTION LOADING PROTOTYPE SYSTEM FOR LADING MEDIUM SIZE MUNITION SUCH AS 120MM MORTAR PROJECTILE.

0 0 0 0 321 470

0 0 0 700 0 0

0 0 0 400 1100 594

0 0 0 0 0 253

MNT PROGRAM PLAN

FUNDING (\$000)

	87	86	89	90	91

COMPAN -- AM(COM

(CONTAGED)

(4789) TITLE - MECHANIZATION OF ASSY OPERATIONS FOR MICLIC

PROBLEM - THE PRODUCTION ASSEMBLY OPERATIONS FOR MICLIC ARE LABOR INTENSIVE RESULTING IN HIGH LABOR COSTS AND HIGH EXPOSURE OF OPERATORS.

SOLUTION - REDUCE DIVERSE ASSEMBLY OPERATIONS TO A FEW STANDARD TASKS WHICH CAN THEN BE EFFICIENTLY MECHANIZED WITHIN THE STATE-OF-THE-ART.

(4796) TITLE - REGENERATION OF SPENT CARBON CONTAINING NITRO-AROMATIC COMP

PROBLEM - ACTIVATED CARBON IS USED TO REMOVE NITROAROMATICS FROM WASTEWATERS AT RADFORD AAP. SPENT CARBON IS BURNED AND THE RESIDUE DISPOSED OF IN A HAZARDOUS LANDFILL. THIS IS ADVERSE TO THE ENVIRONMENT AS WELL AS COSTLY. A METHOD OF RECLAIMING CARBON IS NEEDED.

SOLUTION - THE FEASIBILITY OF THERMAL REGENERATION OF TNT/RDX SATURATED CARBON WITH A ROTARY CALCINER HAS ESTABLISHED BY IOWA AAP. A PROTOTYPE COMMERCIAL UNIT DESIGNED FROM THESE TEST RESULTS FOR RADFORD AAP WILL BE CARRIED OUT.

(4803) TITLE - AUTOMATED INCUNEL LAMINATE FABRICATION

PROBLEM - INCUNEL LAMINATES .050 TO .150 THICK ARE FABRICATED USING CONVENTIONAL M/C MACHINING. INCUNEL IS A DIFFICULT METAL TO MACHINE. THE PER PIECE COST ARE HIGH, DUE TO PERISHABLE TOOL CONSUMPTION & LABOR REQUIREMENTS FOR LOW VOLUME RATES.

SOLUTION - AUTOMATION OF FABRICATION AND PROCESS CONTROL WILL REDUCE LAMINATE COST. FINE BLANKING AS A BASE LINE & PRIMARY SOURCE. TECHNIQUES SUCH AS LASER MACHINING, COMBINED WITH EDM (ELECTRO DISCHARGE MACHINING) OF CRITICAL AREAS WILL BE EVALUATED.

(4819) TITLE - ASSEMBLY TECHNIQUES, TANTALUM TO TITANIUM

PROBLEM - THERE IS A PROBLEM ATTACHING THE TANTALUM WARHEAD LINER TO THE TITANIUM WARHEAD SO THAT Voids ARE ELIMINATED.

SOLUTION - THIS PROJECT WILL INVESTIGATE VARIOUS WELDING AND ADHESIVE TECHNIQUES IN ORDER TO SOLVE THE PROBLEM.

288	213	727	0	0
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461	0	306	0	0
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0	0	0	922	428
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0	0	0	0	600
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MNT PROGRAM PLAN

FUNDING (\$000)

87 88 89 90 91

COMPACT -- ANCCOM

(CONTINUED)

- (4821) TITLE - PRECISION CAST LOADING TECH F/OCTOL IN EXPLOSIVE FORMED PPE
 PROBLEM - THERE IS DIFFICULTY IN MELT POUR FILLING OF THE STAFF BARHEAD WITHOUT LETTING VULUS OR SEPARATIONS OF THE EXPLOSIVE.
 SOLUTION - THE BARHEAD WILL BE MODIFIED AND VARIOUS CASTING TECHNIQUES WILL BE TRIED ALONG WITH MODIFICATIONS IN FIXTURING UNTIL A SUCCESSFUL PROCESS IS DEVELOPED.
- (4836) TITLE - INFARED MOISTURE ANALYSIS OF NUL130 AND LEAD AZIDE
 PROBLEM - PRESENT METHOD OF DETERMINING THE MOISTURE CONTENT OF NUL 130 OR LEAD AZIDE IS A WEIGH-BARE-WEIGH PROCEDURE. THIS REQUIRES TOO MUCH TIME (2.5 HOURS) AND EXPOSE OPERATOR TO EXPLOSIVE MORE THAN DESIRABLE.
 SOLUTION - UTILIZE INFARED SPECTROSCOPY FOR INSTANT MOISTURE ANALYSIS TO REPLACE THE CURRENT METHOD.
- (4838) TITLE - INTEGRATED STATIC ELECTRICITY HAZARD CONTROL PROGRAM
 PROBLEM - STATIC ELECTRICITY HAS BEEN THE CAUSE OF MANY EXPLOSIVE INCIDENTS OVER THE YEARS. METHODS ARE USED TO BLEED OFF STATIC BUILD-UP, BUT IN THESE CASES THE METHODS SEEM TO BE INADEQUATE.
 SOLUTION - THE FY87 TASK INCLUDES DETERMINING THE STATIC ELECTRICITY HAZARD IN SELECTED PROCESSES, TESTING OF STATE OF THE ART STATIC CONTROL DEVICES, PUBLISHING PROCEDURES AND STANDARDS FOR STATIC ELECTRICITY CONTROL.
- (4841) TITLE - WATER BASED FORGING LUBRICANTS EVALUATION
 PROBLEM - USE OF OIL BASED FORGING LUBRICANTS RESULTS IN SMOKE + AIR POLLUTION WITHIN THE PLT. POLLUTION CONTROL EQUIP HAS BEEN INSTALLED IN MOST GCCC FACILITIES. EQUIPMENT IS COSTLY TO INSTALL, MAINTAIN + LIMITED IN SUCCESSFULLY MEETING AIR QUALITY CONTROL.
 SOLUTION - A METHOD OF APPLICATION OF WATER BASE LUBRICANTS WILL BE DEVELOPED, TESTED + TOLLING MODIFICATION MADE AS REQUIRED TO ACCOMMODATE THE METHOD. DETERMINING IF ECONOMICAL FORGING OPERATION CAN BE ACHIEVED TO ELIMINATE OR MINIMIZE AIR POLLUTION EQUIPMENT.

205 290 0 0 0

MMT PROGRAM PLAN

FUNDING (\$000)

67 80 89 90 91

COMPAND -- AMCLON

(CONTINUED)

- (4843) TITLE - PROTO NO PAPER LAMINATION/HJLD PROC F/ISSNM CMO CASE COMP
 PROBLEM - CURRENT COMBUSTIBLE CASE TECHNOLOGY LABOUR INTENSIVE AND REQUIRES HIGH CAPITAL COST.
 SOLUTION - PROJECT WILL SET PROCESS PARAMETERS, GENERATE PROCESS CONTROL DOCUMENTS AND FABRICATE, INSTALL AND TEST AUTOMATED NO PROTOTYPE NO LAMINATION/MODULING PRODUCTION EQUIPMENT.
- (4853) TITLE - DESENSITIZED NG STORAGE
 PROBLEM - NO HANDLING INVOLVED A HIGH DEGREE OF RISK OF INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT AS SHOWN BY NUMEROUS INCIDENTS.
 SOLUTION - UTILIZE ENGINEERING STUDY IA-5-8502 AND ENGINEERING STUDY IA-3-8451 DEVELOP PILOT PLANT PRODUCTION PROTOTYPE FACILITY.
- (4854) TITLE - DYNAMIC SEPARATORS FOR NITRATE ESTER MANUFACTURE
 PROBLEM - SEPARATE SPENT ACIDS QUICKLY TO PREVENT FUME-OFF PROBLEMS.
 SOLUTION - DESIGN, BUILD AND EVALUATE PRODUCTION PROTOTYPE DYNAMIC SEPARATOR.
- (4855) TITLE - PROD PROCESSES F/THERMALLY ENHANCED PROJECTILE TRACERS
 PROBLEM - THERMAL SIGHTING DEVICES ON FIRE CONTROL SYSTEMS REQUIRE SPECIAL TRACERS. ECONOMIC MANUFACTURING PROCEDURES ARE REQUIRED. ALSO SAFETY ASPECTS MUST BE CONSIDERED. FINALLY THE TRACER MAIL MUST BE CAREFULLY CHARACTERIZED TO IDENTIFY BALLISTIC PERF.
 SOLUTION - ESTABLISH OPTIMUM METHOD FOR PROCESSING THERMALLY ENHANCED TRACER MATERIAL. ESTABLISH END ITEM INSPECTION TO CHARACTERIZE BALLISTIC PERFORMANCE. VERIFY PROCEDURES WITH ACTUAL TESTS.
- (4857) TITLE - VOLATILE ORGANIC CARBON EMISSION ABATEMENT
 PROBLEM - ORGANIC CARBON SOLVENTS FROM THE MANUFACTURE OF PROPELLANTS CONTAINING NITROGLYCERIN AT RADFORD AAP ARE PRESENTLY BEING DISCHARGED TO THE ATMOSPHERE. TECHNOLOGY USED FOR RECOVERY OF 50 PREPELLANTS-ACTIVATED CARBON-CANNOT BE USED BECAUSE OF NG.
 SOLUTION - R+D LABORATORY INVESTIGATIONS SUGGEST THAT EITHER BISULFITE SCRUBBING OR MEMBRANE SEPARATION WILL CAPTURE THE VOC SOLVENTS. INVESTIGATE BOTH TECHNOLOGIES IN PILOT PLANTS.

MNT PROGRAM PLAN

FUNDING (\$000)

	87	88	89	90	91
(4858) TITLE - AUTO INSPECTION OF WELDED OVERLAY ROTATING SANDS	0	0	0	290	275
PROBLEM - THERE IS CURRENTLY NO TEST FOR LOAD BETWEEN THE WELDED ROTATING SANDS AND THE PROJECTILE BODY.					
SOLUTION - A STATE OF THE ART DATA ACQUISITION SYSTEM WILL BE ADAPTED TO THE WELDED OVERLAY BEADING PROCESS. ADAPTIVE CONTROL WILL BE INCORPORATED INTO THE PROCESS.					
(4862) TITLE - IMPROVED M243 FUZE ASSEMBLY EQUIPMENT	0	0	0	750	700
PROBLEM - NO KNOWN EQUIPMENT CAN ASSEMBLE THE FUZE AT RATES HIGHER THAN 30 PPM.					
SOLUTION - DEVELOPMENT OF RELIABLE 90+ PPM MACHINERY.					

COMPAND -- ANCLON

(CONTINUED)

(4858) TITLE - AUTO INSPECTION OF WELDED OVERLAY ROTATING SANDS

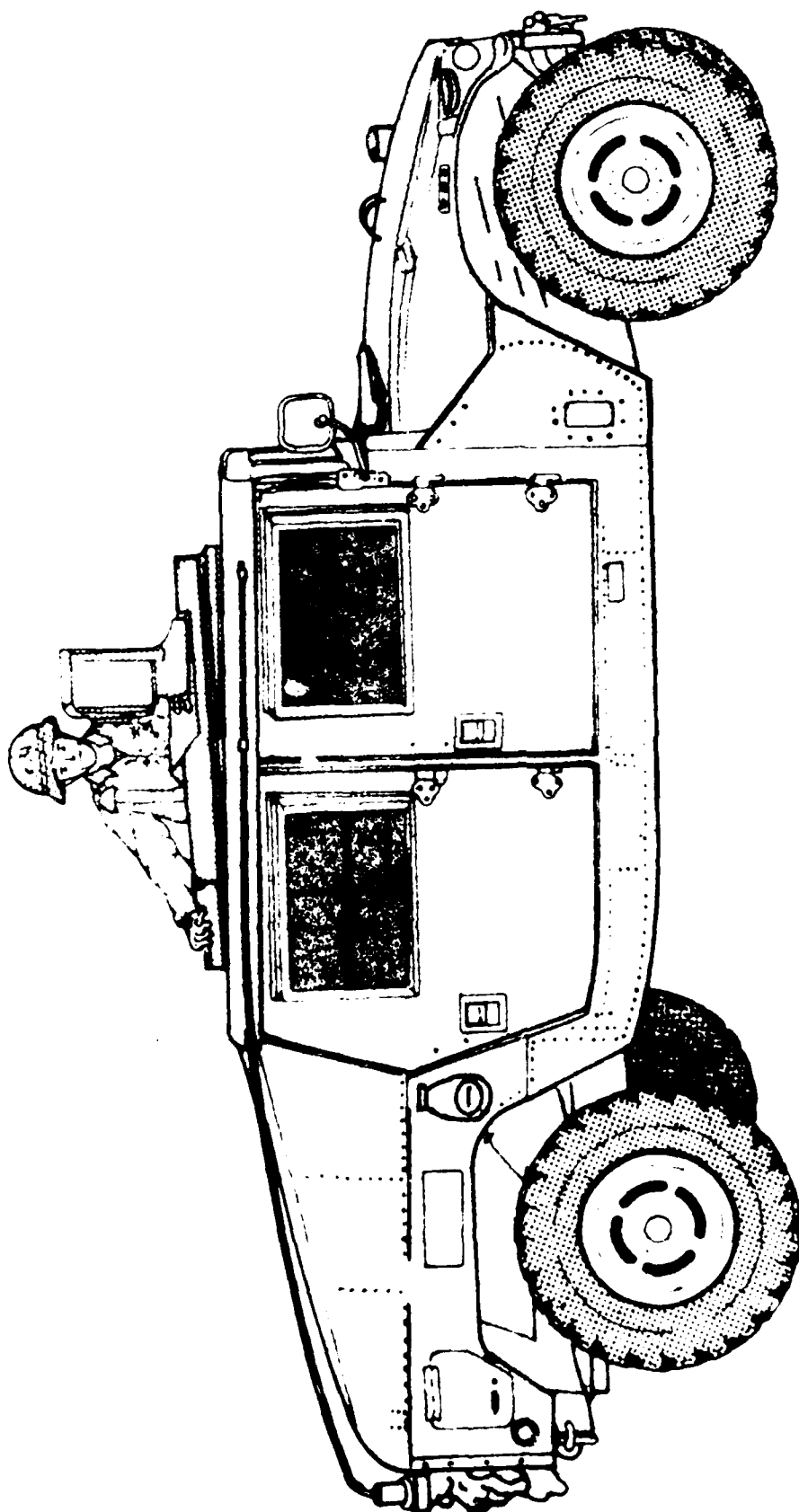
PROBLEM - THERE IS CURRENTLY NO TEST FOR LOAD BETWEEN THE WELDED ROTATING SANDS AND THE PROJECTILE BODY.

SOLUTION - A STATE OF THE ART DATA ACQUISITION SYSTEM WILL BE ADAPTED TO THE WELDED OVERLAY BEADING PROCESS. ADAPTIVE CONTROL WILL BE INCORPORATED INTO THE PROCESS.

(4862) TITLE - IMPROVED M243 FUZE ASSEMBLY EQUIPMENT

PROBLEM - NO KNOWN EQUIPMENT CAN ASSEMBLE THE FUZE AT RATES HIGHER THAN 30 PPM.

SOLUTION - DEVELOPMENT OF RELIABLE 90+ PPM MACHINERY.



DE 64
TACTICAL AND SUPPORT VEHICLES

DE64

C U M M A N D F U N D I N G S U M M A R Y
(THOUSANDS)

C O M M A N D	F Y 8 7	F Y 8 8	F Y 8 9	F Y 9 0	F Y 9 1
-----	----	----	----	----	----
D E S C O M	1040	1173	0	0	0
T A C O M	923	2844	1714	300	200
	----	----	----	----	----
T O T A L	1963	4017	1714	300	200

 C O M M A N D

 D E S C R I P T I O N

MNT PROGRAM PLAN

FUNDING (\$000)
 87 88 89 90 91

(3003) TITLE - SYSTEM FOR ALIGNING • MATING OF POWER PLANT COMPONENTS-SAMP-
 PROBLEM - ENGINES AND TRANSMISSIONS ARE ALIGNED BY TRIAL AND ERROR USING
 CRANES. THIS PROCESS IS TIME CONSUMING AND CAN DAMAGE COMPONENTS.

SOLUTION - DEVELOP A SYSTEM CONSISTING OF 2 FIXTURES (ONE EACH FOR THE
 ENGINE AND TRANSMISSION) FASTENED TO RAILS AND MOVED BY HYDRAULIC AND
 PNEUMATIC CYLINDERS.

(7004) TITLE - AUTOMATED ENGINE BLOCK MACHINING

PROBLEM - THE CURRENT METHOD OF MACHINING AND INSPECTING ENGINE BLOCKS IS
 SLOW AND LABOR INTENSIVE. DURING WARS ARE SET UP FOR EACH MULE TO BE
 MACHINED AND ALL INSPECTION IS DONE BY HAND.

SOLUTION - ESTABLISH A MACHINING CENTER FOR THE REMARK OF VARIOUS SIZED
 ENGINE BLOCKS. INCORPORATING AUTOMATED TOOL CHANGING, INSPECTION, AND
 DOCUMENTATION. MACHINE CONTROL SOFTWARE WILL BE DEVELOPED FOR INDIVIDUAL
 BLOCK SIZES.

(7007) TITLE - ENGINE CONTAINER SEALING

PROBLEM - CURRENTLY ENGINE CONTAINERS ARE CLOSED AND TIGHTENED MANUALLY.
 IN ONE CASE THIS REQUIRES HAND TIGHTENING 32 BOLTS THREE TIMES EACH IN A
 SPECIFIC SEQUENCE.

SOLUTION - THIS PROJECT WILL AUTOMATE THIS PROCEDURE. SPECIAL EQUIPMENT
 AND ROBOTS WILL BE CONSIDERED. THE END PRODUCT WILL BE AN AUTOMATED SYSTEM
 TO TIGHTEN BOLTS ON ENGINE CONTAINERS.

(7009) TITLE - AUTOMATED ENGINE CRANKSHAFT GRINDING

PROBLEM - CURRENT METHOD OF ENGINE CRANKSHAFT GRINDING IS TIME CONSUMING,
 LABOR INTENSIVE WITH LOW PRODUCTIVITY, HIGH COST AND HIGH SCRAP.

SOLUTION - DEVELOP AN AUTOMATED SYSTEM TO REDUCE TIME, INCREASE ACCURACY
 AND REDUCE COSTS AND INCREASE PRODUCTIVITY.

0 160 0 0 0

500 150 0 0 0

310 0 0 0 0

142 663 0 0 0

MMT PROGRAM PLAN

 * C O M M A N D *

 * TACOM *

FUNDING (\$000)

87 86 69 96 91

(4001) TITLE - MANUFACTURING FOR CORROSION PREVENTION

200 200 200 -200 200

PROBLEM - CURRENTLY THE ARMY HAS SEVERE CORROSION PROBLEMS WITH ITS TACTICAL TRUCK FLEET. ACHIEVING CORROSION RESISTANCE THROUGH THE APPLICATION OF RUSTPROTECTING COMPOUNDS CONTRADICTS THE NBC REQUIREMENT FOR VEHICLES WITH CHEMICAL AGENT RESISTANT COATINGS.

SOLUTION - ONE HUNDRED M151A2 TRUCK BODIES FABRICATED OF DOUBLE GALVANIZED SHEET STEEL HAVE BEEN SELECTED FOR TESTS IN A HIGHLY CORROSIVE ENVIRONMENT.

(4012) TITLE - LASER VIBRATION DEPUT INSPECTION SYSTEM

473 526 0 0 0

PROBLEM - NONE AVAILABLE

SOLUTION - NONE AVAILABLE

(4090) TITLE - CELL 9 POWER AND INERTIA SIMULATOR

87 1768 1189 0 0

PROBLEM - AT TACOM THERE IS NO TEST SYSTEM CURRENTLY AVAILABLE FOR TESTING VEHICLES WHICH GIVES QUANTIFIABLE DATA IN ALL THE FOLLOWING AREAS- POWER, BRAKING, STEERING, AND FLUID SYSTEMS.

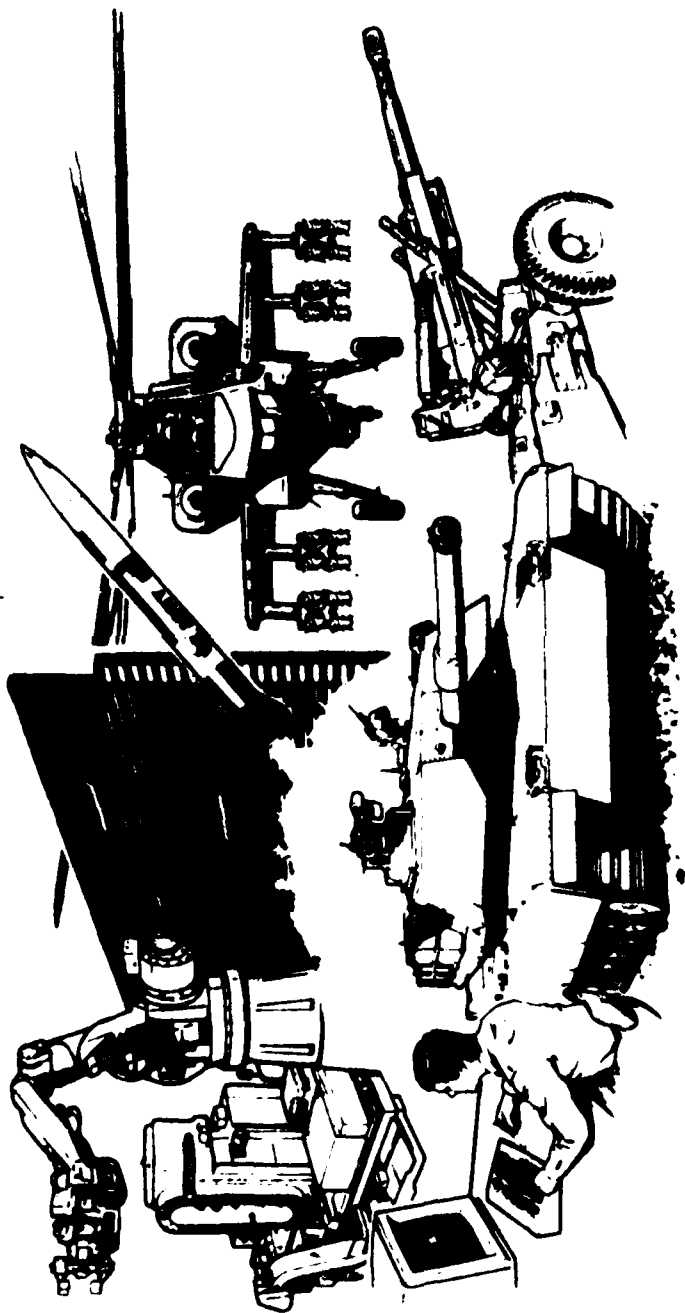
SOLUTION - PHASE 1 WILL INCLUDE PROJECT PLANNING AND DESIGN AS WELL AS BUILDING PREPARATIONS. PHASE II WILL INCLUDE THE PROCUREMENT AND INSTALLATION OF A POWER AND INERTIA SIMULATOR WHICH IS A COMPUTER CONTROLLED TEST SYSTEM.

(5004) TITLE - COMPOSITE/NON-METALS F/PROTOTYPE/LOW VOLUME PRODUCTION

163 350 325 100 0

PROBLEM - NO IN-HOUSE CAPABILITY EXISTS FOR THE DESIGNING, FABRICATING AND TESTING OF ADVANCED MATERIAL ITEMS AT THE PROTOTYPE STAGE. NOR IS THERE A CAPABILITY FOR SMALL SCALE PRODUCTION AND REPAIR OF PROTOTYPES.

SOLUTION - AN ANALYSIS WILL BE MADE TO INVESTIGATE CURRENT DESIGN AND FABRICATION TECHNIQUES AND EQUIPMENT SUITABLE FOR PROTOTYPE AND LOW VOLUME PRODUCTION OF ITEMS MADE FROM ADVANCED MATERIALS INCLUDING COMPOSITES.



DE 66

INDUSTRIAL MODERNIZATION INCENTIVES PROGRAM

DE66
C O M M A N D F U N C I O N I N G S U M M A R Y
(THOUSANDS)

COMRAID	FY87	FY88	FY89	FY90	FY91
-----	----	----	----	----	----
WESCOM	2190	6504	6624	6101	6046
TACOM	0	100	0	0	0
	----	----	----	----	----
TOTAL	2190	6604	6624	6101	6046

 1. SUMMARY
 2. OBJECTIVES
 3. SCOPE
 4. RESULTS
 5. CONCLUSIONS

MAT PROGRAM PLAN

FUNDING (\$000)

	87	88	89	90	91
250	1304	1674	2000	2000	2000

(1100) TITLE - ROBOTIC REPAIR OF PRINTED CIRCUIT BOARDS

PROBLEM - MANUAL METHODS FOR REPAIRING MULTILAYER PRINTED CIRCUIT BOARDS ARE INEFFICIENT AND COSTLY. A RAPIDLY INCREASING REPAIR AND TEST WORKLOAD OF HIGH TECHNOLOGY PRINTED CIRCUIT BOARDS IS SCHEDULED FOR FUTURE SYSTEMS.

SOLUTION - AN AUTOMATIC ROBOTICS REPAIR CAPABILITY WILL BE ESTABLISHED FOR PRINTED CIRCUIT BOARDS AT SACRAMENTO ARMY DEPOT. VARIOUS WORK CELLS WILL BE DESIGNED & INTERFACED. TASKS WILL ALSO INCLUDE INSPECTION & TEST.

(1101) TITLE - INTEGRATED MANUFACTURING IMPROVEMENT PROGRAM

PROBLEM - FACTORY MODERNIZATION IS NEEDED AT SACRAMENTO ARMY DEPOT (SAD). INEFFICIENT, HIGH COST REPAIR PROCESSES REQUIRE UPDATING. IMPROVED TECHNIQUES FOR REPAIR AND TESTING NEED IMPLEMENTATION.

SOLUTION - INTEGRATED COMPUTER AIDED MANUFACTURING (ICAM) DEFINITION MODELING OF DEPOT WILL BE USED TO EXAMINE COST DRIVERS & MODERNIZATION PROJECTS. SPECIFICATIONS WILL BE DEVELOPED & AUTOMATED EQUIPMENTS INSTALLED.

(1202) TITLE - LETTERKNY EVAL ANALYSIS & PLANNING PROGRAM

PROBLEM - THE LACK OF UP-TO-DATE MANUFACTURING AND PROCESSING TECHNOLOGY HAS RESULTED IN HIGHER OVERHAUL/REBUILD COSTS AND ALSO IN LIMITATIONS TO BOTH PRESENT AND FUTURE MISSION NEEDS THROUGHOUT THE DEPOT.

SOLUTION - UPDATE THE DEPOT WITH THE LATEST STATE-OF-THE-ART EQUIPMENT AND PROCESS TECHNOLOGY AVAILABLE TO SUPPORT THE PRESENT AND FUTURE WORKLOADS AND MISSIONS.

(1603) TITLE - CLAD INTEGRATED MODERNIZATION PROGRAM

PROBLEM - THE LACK OF STATE-OF-THE-ART MANUFACTURING AND PROCESSING TECHNOLOGY HAS RESULTED IN HIGHER OVERHAUL/REBUILD COSTS AND IN LIMITATIONS TO BOTH PRESENT AND FUTURE MISSION NEEDS.

SOLUTION - CONDUCT A TOP-DOWN ANALYSIS TO DEFINE AND THEN IMPLEMENT THE LATEST TECHNOLOGY TO SUPPORT PRESENT AND FUTURE WORKLOADS/MISSIONS.

(1690) TITLE - DEPOT ANALYSIS OF RESOURCES AND TECHNOLOGY

PROBLEM - THE AGING FACILITY AND OUTDATED TECHNIQUES HAVE RESULTED IN AN INEFFICIENT OPERATION AND SLOW DELIVERIES.

SOLUTION - DEVELOP AND DEFINE AN ENVIRONMENT AND IMPLEMENTATION PLAN TO IMPROVE PRODUCTIVITY, REDUCE REFURNISHING COSTS TO THE ARMY, AND INSURE TIMELY DELIVERY.

HMT PROGRAM PLAN

FUNDING (\$,000)

87 88 89 90 91

CURRAN, -- DESLOM

(CONTINUED)

(1002) TITLE - LEXINGTON-BLUE GRASS PRODUCTIVITY IMPROVEMENT PROGRAM

PROBLEM - EQUIPMENT AND FACILITIES ARE OUTDATED AND OBSOLETE.

SOLUTION - DETAILED DESIGN OF APPROVED IMPROVEMENT PROGRAMS.

.....
 C H M A M U

 TALON

0 100 1200 300 0

(14-91) TITLE - TACUM LABORATORY MODERNIZATION PLAN

PROBLEM - THE OUTDATED AND AGING FACILITIES MAKES IT DIFFICULT TO MEET THE REQUIREMENTS OF DOD.

SOLUTION - DEVELOP A MODERN, EFFICIENT RO-0E CENTER BY PERFORMING A COMPLETE ANALYSIS OF THE CENTER, A DESIGN AND ASSOCIATED SPECIFICATION OF THE RESULTING PROJECTS, AND THEN IMPLEMENTING THE RESULTS OF THESE PROJECTS.

0 100 0 0 0

APPENDICES

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AD-A178 743

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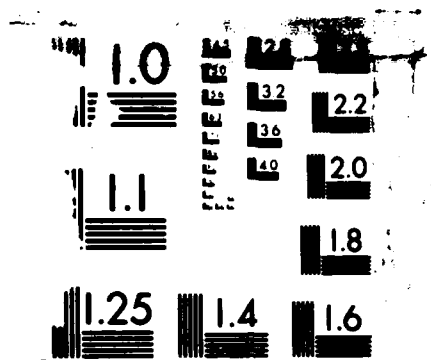
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Cdr, Sacramento Army Depot, ATTN: SDSSA-QSM-2 (Mr. Mike Shuehan), SDSSA-RPM-1
(Mr. Pat Coghlan), SDSSA-MFE
Cdr, Seneca Army Depot, ATTN: SDSSE-FX (Mr. Scott Woodworth)
Cdr, Sharpe Army Depot, ATTN: SDSSH-FMD (Mr. John Creedon)
Cdr, Sierra Army Depot, ATTN: SDSSI-DED (Mr. Donald Smedes)
Cdr, Tobyhanna Army Depot, ATTN: SDSTO-M, Technical Library, SDSTO-ME-E
(Mr. Frank Estock)
Cdr, Tooele Army Depot, ATTN: SDSTE-MAR, SDSTE-FM, SDSTE-FM (Mr. E. Perkes)

Army Organizations:

Dir, AMC School of Engineering & Logistics, ATTN: AMXMC-SEL-E (Mr. Carter)
(Mr. Achord), AMXMC-SEL-L (Mr. H. E. Lynch)
Cdr, Army Applied Tech Labs, ATTN: SAVRT-TY-ATS (Mr. J. Waller)
Cdr, Army Avionics R&D Command, ATTN: DAVAA-P-TP (Mr. J. Parker)
Cdr, Army Foreign Science and Technology Center (FSTC), ATTN: AIAST-RA-ST3
(Mr. David Barlow)
Cdr, Army Installations & Services Activity, ATTN: AMKEN-RI
Cdr, Army Logistics Management Center (ALMC), ATTN: AMXMC-ACM-MA (Mr. East)
Dir, Army Management Engineering Training Activity (AMETA), ATTN: AMKOM-SE
(Mr. William Beasley) (3 cys)
Cdr, Army Plant Rep Office, ATTN: SAVBV-Q (Mr. James Doyle)
Cdr, Army Research Office (ARO), ATTN: SLCRO-AO

DISSEMINATION (Cont'd):

Army Organizations (Cont'd):

Cdr, Detroit Arsenal Tank Plant, ATTN: AMCPM-M60-TP (Mr. Tom Zenke) (2 cys)
Cdr, Dugway Proving Grounds, ATTN: Technical Library
Cdr, Barry Diamond Labs, ATTN: SLCHD-PO-P (Mr. Julius Hoke) (Ms. Mary Binseel)
Cdr, Night Vision & Electro-Optics Lab, ATTN: DELNV-SX
Cdr, White Sands Missile Range, ATTN: STEMS-TE-TL (Technical Library)
Cdr, Yuma Proving Grounds, ATTN: Technical Library
Cdr, West Coast - TILO, ATTN: Mr. C. Green

NASA:

Ames Research Center, ATTN: Dr. Walter Goldenrath
NASA Headquarters, ATTN: Mr. Ray L. Gilbert (2 cys)

Air Force:

Cdr, Air Force, ATTN: USAF/RDCM (MAJ Tom Fitzgerald)
Cdr, Air Force Systems Command, ATTN: AFSC/DLF, AFSC/PPD, AFSC/PNDE,
SD/PD (Mr. Henry Black), ASD/ENSID (Mr. John Hiles)
Cdr, Air Force Wright Aeronautical Lab, ATTN: AFWAL/LT, AFWAL/LTE, AFWAL/LTM,
AFWAL/LTN, AFWAL/MLSS (1 cy ea)
Cdr, Hanscom AFB, ATTN: Mr. John Orphanos
Dir, Marshall Space Flight Center, ATTN: AT-01 (Mr. Walt Crumpton)
Cdr, San Antonio Air Logistics Ctr, Kelly AFB, ATTN: MBEI (Mr. B. Boisvert)

Navy Organizations:

Cdr, Dept. of the Navy, COMFAIRWESTPAC, ATTN: LCDR S. D. Lisse
Cdr, Long Beach Naval Shipyard, ATTN: Code 202.4 (Mrs. Zeoli), Code 385
(Mr. Louis H. Smith), Code 300.02 (Mr. C. Rogers)
Cdr, Los Alamos National Laboratory, ATTN: A. P. Torres
Cdr, Naval Air Systems Command, ATTN: Code AIR 7640 (Mr. R. A. Retta)
Cdr, Naval Avionics Center, ATTN: Code 2143 (Mr. Larry Halbig)
Cdr, Naval Material Command, ATTN: Mr. J. W. McInnis
Cdr, Naval Mat Comd Ind Resources Detachment, Bldg. 75-2
Cdr, Naval Ocean Systems Ctr, ATTN: Code 926 (Dr. Wil Watson)
Cdr, Naval Ordnance Station, ATTN: Code 5253 (Mr. Craig Smith)
Cdr, Naval Sea Systems Command, ATTN: Code SEA-05R23 (Mr. T. E. Draschil)
Cdr, Naval Surface Wpns Ctr/Dahlgren Lab, ATTN: Code E 431
Cdr, Naval Surface Wpns Ctr/White Oak Lab, ATTN: Code E345 (Mr. Charles McFann)
Cdr, Naval Weapons Ctr, ATTN: Code 36404
Cdr, Sandia National Lab, ATTN: Mr. Jake Gonzales, Mr. L. W. Dahlke

Miscellaneous Organizations:

Aerospace Industries Association (2 cys)
ATTN: Mr. Stanley N. Siegel, 1725 DeSales St., N.W., Washington, DC 20036
American Defense Preparedness Association (5 cys)
ATTN: Mr. William Holt, 1700 N. Moore Street, Arlington, VA 22209
American Society for Metals (1 cy)
ATTN: Mr. James Hontas, Metals Park, OH 44073
American Society for Testing and Materials (5 cys)
ATTN: Mr. Samuel F. Etris, Special Assistant, 1916 Race Street,
Philadelphia, PA 19103
Association for Integrated Mfg Tech (3 cys)
ATTN: Ms. Marti DeGraaf, 111 East Wacker Dr., Suite 600, Chicago, IL 60601

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DISSEMINATION (Cont'd):

Miscellaneous Organizations (Cont'd):

Cast Metal Federation

ATTN: Mr. William E. Gaphardt, Chairman, Govt. Supply Committee,
4870 Packard Road, Niagara Falls, NY 14304

Defense Logistics Agency (1 cy)

ATTN: DIPEC-SSM, Mr. Garland Smith, Airways Blvd., Memphis, TN 38114

Department of Energy (1 cy)

ATTN: DOE/NBL, Mr. Warren McGonnagle, 865 Saylor Avenue, Elmhurst, IL
60126

Electronics Industries Association (40 cys)

ATTN: Mr. Jean Caffiaux, 2001 Eye St., N.W., 8th Floor, Washington, DC
20006

Forging Industry Association (35 cys)

ATTN: Mr. Robert W. Atkinson, Room 1121, 55 Public Square,
Cleveland, OH 44113

Manufacturing Technology Information Analysis Center (MTIAC) (1 cy)

ATTN: Mr. Thomas Turner, 10 West 35th Street, Chicago, IL 60616

Metcut Research Associates, Inc. (1 cys)

ATTN: Mr. John Kahles, 3980 Rosslyn Drive, Cincinnati, OH 45209-1196

Society of Manufacturing Engineers (1 cy)

ATTN: Mr. Tom Heath, One SME Drive, P.O. Box 930, Dearborn, MI 48128

US General Accounting Office (1 cy)

ATTN: Mr. Thomas O'Connor, 441 G Street, N.W., Room 6027, Washington, DC
20548

**INDUSTRY ATTENDEES OF THE MANUFACTURING TECHNOLOGY ADVISORY GROUP (MTAG) ANNUAL
MEETING, NOVEMBER 1986**

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